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Cover: Nick Hackett took this photo while flying his LS-7 along the Blattberg ridge towards the 9720ft Zugspitze in Austria. Ehrwald lies below to the right and Innsbruck 45km, underneath the thread, beyond. Note the height of the cloudbase over the standing thermal above the west wall of the Zugspitze. See Nick's article on p28.

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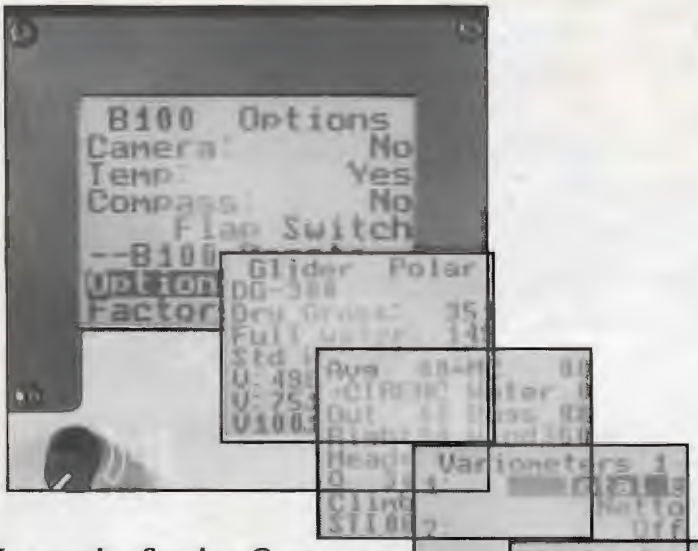

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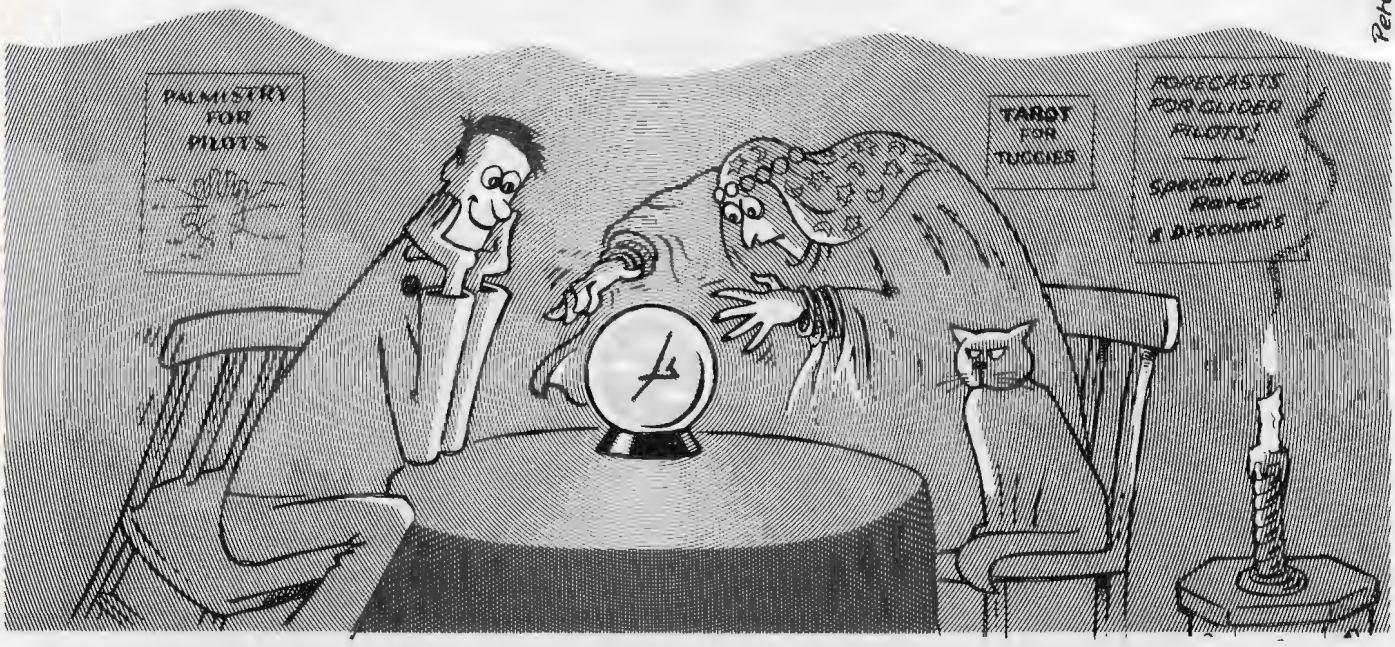

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YOUR LETTERS

WHY SO FEW FREQUENCIES?

Dear Editor,

Peter Taylor in the October issue, p233, spends three paragraphs and an afternoon's flying to work off his frustration at a bit of boorish radio chatter directed at some gabbling German ladies who were blocking the startline frequency of 130.1 on July 29 during the Booker Regionals.

These ladies certainly were chattering like teenagers on the telephone and deserved to be invited to silence. However, we all know that there are many occasions when there is excessive and unnecessary chatter on the air caused by members of our own clubs. I have discovered to my cost that any personal intervention encouraging windbags to curtail their woffle is always followed some minutes later by my own call announcing an impending land out.

The serious question which needs answering is why we put up with so few frequencies. There are over 3000 British gliders trying to share a total of four frequencies, which simply is not enough. Some of us even occasionally pay the radio licence fee, for which we get very little from the government. I think this is something worth campaigning for. Does anyone out there agree?

SIMON ROBERTS, *Kemply, Glos.*

THE CASE FOR A TURBO

Dear Editor,

It is the firm belief of the BGA that a pilot's abillty to soar, and therefore fly cross-country, is of prime importance. The BGA requires a potential instructor to have a proven minimum cross-country ability before accepting them on an instructors' training course. It also requires the qualified instructor to continue to fly solo so as to maintain his or her ability to soar. I am very pleased to see that these minimum standards have been exceeded by the requirements of some CFIs.

It is therefore reasonable to assume that any way in which cross-country experience can be gained is good news.

One of the major problems facing cross-country flying is the possibility of field landings. Some pilots consider these landings great fun, and indeed they can be. They require a higher than normal level of skill, so the adrenalin always flows a little faster. They are exciting, just like cross-country flying. However, very few pilots enjoy waiting around for a long retrieve.

The problems of crews can be reduced in competitions and soaring weeks. Perhaps this is one of the major reasons why these events are so popular? But for a normal pilot even flying at weekends, crews are a problem. Should you be fortunate enough to be able to fly midweek, the almost total lack of retrieve resources results in nearly all pilots remaining close to, or within, gliding range.

Field landings are also a potentially dangerous situation. Field selection is a learning exercise. Different times of year, crop types, shades of green, etc, etc make the selection interesting. Ground conditions, undulations, slopes, trees, power wires, electric fences all add to the fun.

We all think we can plan circuits, and indeed the majority of us can, but it's surprising when faced with a field landing how we get it wrong. Whether we like to admit it or not, we do rely to some extent on local features. No one finds it easy, and even the most experienced Nationals' pilots make mistakes.

I believe that for the majority of pilots, the possible removal, or at least a sizeable reduction, in the chances of being faced with a field landing would certainly encourage pilots to fly cross-country more often. I therefore put forward the case for a turbo. A self-sustaining retractable engine.

Now let's look at the possible disadvantages.

There's no point in going on a cross-country if you know you can get back! Rubbish. In many respects this is the whole point. It gives you the chance to learn to fly cross-country, and if you get it wrong, or the weather lets you down, you have a reasonable chance of returning with the minimum inconvenience to either yourself, or others. Starting the engine is deemed a fail situation, game over! Pilots enter competition tasks not only assuming to get back, but also to return with a high average speed. I'm talking about a self-sustaining turbo engine, not a motor glider. These engines just let you gain height, in my case at a rate of about 1½kt. This lets you get to the next thermal. This is not the same as motoring around the countryside.

You have to abandon soaring at a greater height because you need height to start the engine. This is true. At 1000ft agl I try to start the motor. This is done in the high key area flying downwind leg into my chosen field. If it starts fine (so far every type has started without fail), if not I continue with the circuit. All the types I've flown require about 150ft to start the engine, so I've got two attempts to try to start it before turning base leg. If you think starting downwind leg on a field landing circuit at 1000ft is too high for you, then the height difference is my penalty for having an engine.

What if it doesn't start?

Continue with the circuit. The gliding performance is certainly worse. Be prepared to modify your circuit, but it's not a hang glider yet. What have you lost? Possibly a few 100ft of low level scratching. Should you run into a thermal even now, it's possible to get away.

Its extra weight ruins the glider's performance!

When I first had a Ventus CT it didn't have the engine fitted. It was certainly the case that we needed to put one tub of water in each wing every time we flew. Without the water it was so light it bounced about all over the place. All the syndicate agreed it flew better with the water. When the engine was fitted it took the weight of the water. In my experience the performance difference except on the very weakest of days is extremely small.

There is also a financial cost to an engine, and I accept that the capital cost of the motor is worth a considerable number of aerotow retrieves. I am, however, prepared to pay for convenience. I can only comment that the engine retrieve facility has given me the chance to try to fly on many more days than I would have normally. Last season I flew about 9000km cross-country and resorted to using the motor five times. In addition the use of the motor has enabled me to contact wave on three occasions when all the other gliders couldn't get across the gap.

It does alter my attitude to flying. It gives me the convenience to try when most others don't bother, and as a result I have enjoyed more cross-country flying than ever.

Isn't this what we all want?

CHRIS PULLEN, *Senior regional examiner, Thames Valley*

ALL IN THE BGA INSTRUCTORS' MANUAL

Dear Editor,

Mike Randle raised a good point about spin recovery in his letter in the June issue, p119. He is quite right, not enough has been said about such matters, or indeed when it is appropriate to teach spinning.

I feel his question merits a fuller reply than Chris Rollings' brief comments and such a full discussion will be found in the forthcoming BGA Instructors' Manual. In short, I agree absolutely that prior exposure to steep attitudes (whether by dives, spins and recoveries or by looping) is vital before any useful spin recovery training takes place.

MIKE CUMING, *London*

WHY ARE THERE WOMEN ONLY COMPS?

Dear Editor,

I read in the last issue, p312, that there was a Women's European Championships at Husbands Bosworth last summer. What on earth is the country coming to when women need the comfort of sexually segregated competition?

At the level of competition our sport is purely a test of mental acuity and not physical ability, and I am at a loss to understand the need for women to compete only against themselves. I surmise that this is a competition for ladies who do wish to compete, but not very much. I would recommend them to the Open Class Nationals where the competition is modest and the participants mainly old women.

LARRY AUTRE, *Woodchester, Stroud*

WINCH LAUNCH SPINS

Dear Editor,

Bill Scull's article on winch launch spins in the last issue, p302, picks out the essential feature of a minimum safe climb speed from the many other factors of hook position, elevator power, weak link strength, winch power and so on – will this eliminate the hair-raising sight of gliders at some clubs taking off routinely with full aft stick, clearly without the certainty that this speed will be achieved? The same points were made in my articles of a few years back, though perhaps not so clearly.

Even with enough forward stick to balance the pitch due to the cable, the rotation into the climb which results from increasing airspeed and hence increasing lift is devoutly to be desired as confirmation that the speed is sufficient to augment the climb with more aft stick. If it doesn't occur then don't try without double-checking the speed as well, which all pilots do anyway, don't they?

Weak links have not traditionally been chosen to give stall protection, but rather to protect the wing structure. In this they are singularly ill-assorted, *eg* the light K-8 with a good strong one to the pathetic piece of string on the heavy Astir or big-winged Pilatus. I attempted a while back to get OSTIV to adopt a minimum strength of twice the AUW, which is enough to avoid nuisance breaks but not to break the wing, but without success. Considering the steepness of the climb at low heights in Bill's picture, remembering to add the angle of attack to get an attitude of some 65 to 70°, breaking the weak link is just as likely to provoke a flick into a spin as stalling at a slightly lower speed, since with the stick likely to be hard back the glider will pitch up smartly.

I hope we are to be treated to a description of the experiments by Mike Cuming and Chris Rollings into the use of canopy strings to indicate angle of attack, which they came across in visits to the Blackpool GC – (where else? Thanks for the testimonial, Mike). Invented by Keith Emslie many years ago, they have proved illuminating to many even though they are a nuisance to keep serviceable. They show very clearly the relationship of speed and angle of climb with angle of attack.

JOHN GIBSON, *Lytham St Annes, Lancs*

SPINNING ON A WINCH LAUNCH

Dear Editor,

The article on spinning on the winch launch reminds me of my own experience in this field. In 1948 the London GC had a Grunau Baby (one of the total of 250 000 built worldwide), but with only a nose hook it could not be launched very high from the small field we had at that time. So Bolton of Bolton and Zander took it into his workshop in Dunstable High Street and fitted one to the bulkhead behind the seat.

This worked very well, too well in fact. We were launching from the south-west and I noticed that George Scarborough, who had launched just before me, had done a bit of a twitch half way up the launch. Instead of stopping and having a good think about it there and then we carried on. ➡

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It was my turn next and I must have pulled the stick back even more than George because at about 50ft the wing dropped to the right and I found myself hurtling towards the hill in a 90° bank. I pulled off and was then confronted by the power lines, so I climbed over them and turned back into wind not hearing the cries of those who were telling me to land downwind.

The combination of climb and turn caused me to flat spin on to the ground, landing in a dried harrowed field of chalky soil, producing a large cloud of dust. When this had all settled we found that the skid rubber had been twisted off, so the damage had not been too bad.

When I returned to the clubhouse for tea my parents greeted me "Brennig you should have been here a minute ago, it was terrific. A glider took off, did a little turn and landed again in a cloud of dust". "Yes I know" I said, "it was me in it".

The moral of this tale is don't take your parents to the gliding club, not at least when you are flying. The Grunau Baby was taken back to Bolton and Zander where they found a better position for the belly hook a bit nearer the nose. With the belly hook the stick force per *g* is a bit too low so you don't get a proper feel for the structural and aerodynamic loads you are putting on the airframe.
BRENNIG JAMES, *Marlow Common, Bucks*

CAN ANYONE HELP?

Dear Editor,

I have a copy of **Werkstattpraxis für den Bau von Gleit und Segelflugzeugen** by Hans Jacobs, the famed sailplane designer, but the front fly, title pages and first 17 pages of text are missing. If anyone would be willing to provide photo copies of the missing pages I would be very grateful and, of course, would defray copying and postage costs.
DAVID BARLEY, *West Croydon, Surrey*
(Please write via S&G.*)*

We welcome your letters but please keep them as concise as possible and include your full name and address. We reserve the right to edit and select.

NOT ONE OF OUR MEMBERS

Dear Editor,

I refer to Mike Cuming's reply in the last issue, p291, to a letter from David Iske, Usk, Gwent.

I would like to point out that David Iske has never been associated with the South Wales GC and his comments do not reflect the views of this club.

I would suggest it was quite wrong of Mike to assume that because a correspondent's address is in Usk, Gwent, he was a member of the SWGC. It follows that he should also refrain from making any adverse comments about a club with which he has had no personal contact.
K. G. COUNSELL, *chairman, South Wales GC*

WORLD CLASS

Dear Editor,

The impact on gliding of a one design Class is yet to displace the discussion of the latest hot ships as a debating topic in our clubhouse.

One characteristic of the Class that might become significant in the future is the longevity of the competitive life of the glider. If the Class is a success, then the health of the second-hand market should serve to minimise the cost of ownership rather more than any saving associated with an absolute minimum new purchase price.

Minimum cost of ownership will actually depend on the performance of the Class being sufficient for people still to want to buy the Class ten (or twenty) years from now.
IAN LEWIS, *Lasham*

REVIEW

Crabb X-C Tasksetter, available at £39.95 from Crabb Computing, 1/2 Hall Rd, Wolvey, Leic LE10 3LG, tel 0455 220899.

Ask any experienced cross-country pilot what it feels like to arrive at a TP only to find the feature is ambiguous or even no longer exists. Several years ago, some larger clubs made life easier by compiling TP lists, an idea the BGA Competitions Committee formalised about a year ago by producing a list covering the whole country.

This winter I discovered a computer program which encompasses this list in its entirety and also allows the user to define new TPs. The program doesn't stop at listing some 500 TPs, giving the detail of the feature and the grid reference. It also allows the user to experiment and set tasks using up to six TPs by list searching or using a map facility on which you simply draw the task you fancy. The computer then selects the nearest TPs to your route and gives all the details and distances.

Further modification of your task is simple and you can even call up areas of controlled airspace on the map to see if you need control points. Unlike other programs, even Scotland is well covered with TPs but sadly the map facility doesn't extend that far (although I've been informed that a Scottish version is available on request).

The idea is not new. John Williamson and I found an earlier, more limited Spectrum program invaluable as we toured the country as coaches many moons ago, although this new program has another function which makes it unique and ideal for individual and club use. Incorporated into its memory are over 150 types and variants of glider, each with its BGA Speed Index (including wet index if applicable). After you have planned your task it will tell you what your National Ladder score will be if you succeed, or alternatively what your day's flying has earned you. It also allows you to "windy-cap" your scoring.

The program runs on IBM compatibles and is very user friendly. It is the ideal aid to one's imagination when planning tasks while the winter snows cover the hangar, and invaluable in the summer for easy task setting after the 6.30 BBC weather forecast.
KEN STEWART

CANADIAN CHAMPION

Andy Gough (Junior – for the many who will remember his father with affection) won the 1991 Canadian Standard Class Nationals in an LS-4 last June.

GLIDING IN GREECE

Antony Makrogikas of the Athens GC has written with details of gliding in Greece. There are only three clubs but gliding is cheap with flying throughout the year. The Athens club is on a military airport but the big problem, which they hope will soon be resolved, is that only local flights are allowed.

TAIL FEATHERS

Introduction to S&G *Classic*

I have always yearned for the greatest honour that British society can bestow, which is to be the guest on the BBC radio programme Desert Island Discs (knighthoods and peerages come a long way below) to be asked what my favourite records are. It's about the equivalent

My favourite records.

of appearing on the front cover of *Time* magazine in the USA; but to be on this radio show not only indicates that one has really arrived as a celebrity, it gives one an opportunity to demonstrate one's broad cultivated tastes by a subtle choice of cantatas, string quartets, modern jazz and Shakespeare readings. A great ego trip, in other words. One woman singer chose eight records all of herself, without a blush.

The editor of *S&G* has done me an honour which is the next best thing to being on Desert Island Discs, and asked me to choose some classic pieces from our esteemed organ for your delight and instruction. You'll be glad to know that I won't be following the opera singer's monstrous example by dredging up my old Tail Feathers columns. (How do you know I don't do it to you already without letting on?)

The first two pieces that I have selected are both howldunits. This will quite possibly come as a surprise to you, for the art of describing great flights in an interesting way has largely disappeared. One reason for that loss is the dreariness of most contest- flying: "seven triangles all going through Husband's Bosworth" is how I describe it[1]. Modern contests have not produced any accounts to match that of Nick Goodhart's goal record, Lasham to Portmoak, in 1959 or Philip Will's hair-raising wave, ridge and thermal flight in the 1956 World Champs at St Yan. (OK, New Zealand, prove me wrong in 1995!) There is also the problem that the pressure in today's Championships is not conducive to thinking about anything but beating the other guy – not the weather, but merely the other competitors. Modern contest pilots would sooner do boring, slow flights that under utilise the conditions, so long as they ensure that they keep their nearest rivals in their sights and can prevent them from gaining an advantage. The same happens in other sports: footballers will get a one goal lead then try to clamp the game down until the whistle goes; cricketers slow the over rate and waste time.

Ruthless competitor.

You will hardly be surprised, therefore, when I tell you that one of the howldunits appeared 31 years ago and the other 40 years ago, before the closed-circuit speed obsession took hold. They are completely different in many respects: the first flight is in Britain, flown apparently haphazardly in pretty poor conditions in a pre-war strutted trainer yielding a glide angle of 13:1, the other a carefully planned record attempt in mouth-watering weather in America, using a state-of-the-art laminar flow forerunner of today's starships, boasting a good 40:1. What the two flights have in common is more important, however. Both pilots have been great natural fliers for over 40 years, hugely enthusiastic, and both convey their enjoyment through their writing – and they both went downwind, more or less.

JJ

John Jeffries is an utterly unusual pilot, gradually acquiring the status of a legend. His intense curiosity about the air, why and where it goes up or goes down, and his distike of towns and man-made scenery, make him a restless explorer of ridges and valleys, molehills and mountains – the wilder and more remote the better. The fact that today he performs his long-distance meanderings in an ASH-25 means that there are now real live witnesses to stories which previously defied belief. His former passengers are easily identified: they can be seen holding the attention of the bar with a glittering eye like the Ancient Mariner, waving their arms dementedly in an effort to describe the indescribable: the hours of struggle upwind under a slate-grey sky[2] in thermals so weak as to be imaginary; the hairbreadth escape from the hopeless depths of some sheep-strewn, rainswept Welsh valley; the last minute contact with wave; the ascent to 16000ft as the sun sets countless miles from home; the leaping from wave to wave in the gathering dusk; the homecoming on Dunstable's rollercoaster field between ranks of car headlights. There's another poor soul for whom gliding will never be the same again.

Rainswept Welsh valley.

But we are here today to talk about the Cadet flight in which I had a triple interest. First I had a 20% share in that machine, restored with great affection by Peter Fletcher, who was the kindest, most decent and at the same time the most choleric man, who could explode with indignation if provoked, and sometimes without being provoked. The share cost me £10. You can't get much of anything, even a launch, for £10 these days. What transformed these old gliders was aerotowing, since the feeble winches of the 1950s and the pathetic penetration of the aircraft meant that you were on the ground in two

JJ photographed by Michael Bird at the 1989 Open Class Nationals.

[1](The truth is, Plat is a Jekyll-and-Hyde character: once he arrives at a contest site, he is suddenly transformed from a charming and generous member of civilised society into a ruthless competitor, battling ferociously for 20th place with all the other dregs. He displays the most unattractive characteristics of real contest pilots without any of their flying skill or organisation on the ground. He enjoys it hugely at the time, but after the end of the Comp forgets the experience entirely and goes back to whingeing about contests being a total waste of weather. Ed)

[2]On a typically miserable day at Dunstable JJ will say, in total seriousness "If you can get away to Wales I'm sure you'll find it rather good." Wales being 100 miles upwind. Then he sets off and goes there.

minutes after most winch launches.

Secondly, I flew that same day, in an immensely superior Olympia 2B, after watching JJ take off behind the Tiger Moth. I went all of 16 miles to Henlow, brought down by the vast gaps between clouds, and by my own inexperience. Cloudbase was unusually high for England, over 7000ft asl, hence the yawning gaps between. When I phoned in from Henlow and heard that JJ had taken our Cadet to Cranwell aerodrome. I scoffed "You mean *Cranfield* aerodrome!" Cranfield was also only 13 miles away. But I was wrong.

Lastly I was at that time the editor of the London Gliding Club Gazette, a beautifully typeset magazine with photographs and even a spot of colour on the cover[3]. How the local printers did the whole job for about £15 for an edition of 400 copies, I have no idea. I badgered JJ for months to produce his story, and despaired of seeing it. Then it arrived, I printed it uncut, including the last line "I still haven't had my five shillings!" That was a serious mistake for an editor. In the middle of the night I was telephoned

Middle of the night.

by an apoplectic, but unfortunately not speechless, Peter Fletcher. His honour had been besmirched, he would sue, I would never fly the Cadet again so long as I lived, I should be horsewhipped etc etc. Eventually he was not so much pacified by me as exhausted by his rage. I rightly assumed that he did not have JJ's phone number readily to hand, since JJ was not a partner in the Cadet syndicate; otherwise there would presumably have been even worse imprecations hurled at JJ's head. The problem was, various people had forgotten what had been agreed to constitute "halfway to Wales", which JJ explains in the story.

Anyway, in the *S&G* version of this epic, JJ's jocular and inadvertent near-libel was excised, and old friendships were spliced and glued back together. The five shillings was used to good effect at the bar, beer being about a shilling a pint in 1960.

Many years later I went to Peter's funeral, and remembered our association, and how close it came to sundering. He was a much-loved man. Here comes a resounding cliche – they don't make characters like that any more. Well, some cliches are true.

I hope that he will forgive me for adding this little tailpiece to JJ's story.

[3] *The present London GC newsletter is a first class read, but is not typeset professionally. I grudgingly suspect that it is better than most of the 1960 Gazettes, but in those days I gave the punters style, if not substance. (So what's new? Ed.)*

DUNSTABLE TO CRANWELL IN A KIRBY CADET

The Kirby Cadet, of 40ft span, was produced by Slingsby in 1936 (with the spelling "Kadet") as a secondary training machine, a category which was first introduced in 1926 with the German Prüfling to enable ab-initio pilots to reach the soaring stage. For many years the Cadet was widely used in the Air Training Corps as a primary solo trainer under the name "Cadet Mark 1". But now, with an 130 mile cross-country to its credit, as described in this article reproduced from the London Gliding Club Gazette, it has left these inadequate classifications far behind.

S & G CLASSIC

CHOSEN BY PLATYPUS

The ranks of those who can recall with affection that one-time high performance sailplane the Kirby Cadet Mark I are, alas, becoming sadly depleted. Even more sad perhaps is the increasing scorn with which such relics of the "bad old days" are regarded by the unfeeling new generation of self-styled pundits, and by the old hands who choose to forget.

Personally, the Cadet symbolises the passing of the fun, sport and amusement era of gliding, so that I jumped at the opportunity to fly Peter Fletcher's version in the hope of recapturing something of the excitement of the past. To be a little more honest, I have to admit to engineering the opportunity by the well-tried flattery process – carefully camouflaged, of course.

Perhaps the flattery was a bit overdone, because Peter was soon imploring me to fly the machine away just to prove once and for all that the performance of this Cadet was at least equal, if not actually superior, to that of the Skylark 3. I egged him on further by suggesting that the Long Mynd, a mere 120 miles away, was a task well suited to the machine. But even Peter was a little sceptical of such a suggestion and, falling beautifully for the bait, laid a wager that not half the distance could be covered.

To impress me still further with the capabilities of his machine, he modified his flutter by allowing 60 miles to be covered in any direction. This was good because my navigational prowess is limited, and the whole five shillings might be very useful to help towards the retrieve. Thus morally fortified, we dragged the Super Cadet to the launching point.

Perhaps it might be as well to explain to those few who do not already know that the Cadet in question is named "It". This rather curious name is derived from its recall sign (which just proves its soaring ability). If, therefore, I refer to "IT", I do not mean to be derisive. Anyway IT and I were eventually lined up for the second aerotow of the day, after a protracted wait for cumulus to form. Donned in lightweight goggles and sitting on a lightweight foam plastic cushion, fully half an inch thick, the IT and I took the air.

The first part of the launch was a trifle hairy, not, of course, due to the superior handling of the machine, but to the fact that the wind was easterly and take-off was towards the hill. Surprisingly enough, the remainder of the tow was exceedingly smooth and pleasant and I completely forgot what I was flying. This was really rather careless because, on casting off in the first thermal we struck, I perceived that we were at a mere 900ft and only marginally within gliding range of the club.

Fortunately the thermal did its stuff and lifted us to 3000ft, albeit rather slowly. At this height I left to try my luck with another cloud before setting off, and after a rather embarrassing scrape at no great height and out of range of the site, achieved a more satisfactory rate of climb. Estimating a vertical height of 1000ft from cloudbase (I hope not too inaccurately), we thundered off in true competition style in the direction of downwind, which by a strange coincidence, corresponded roughly with the intended track.

We pursued the sort of route that might well have been taken by a drunken fly

One lesson was very quickly learnt, and that was that if we were to remain airborne at all, the nearest source of lift had to be utilised whether or not it lay on course. Hence we pursued the sort of route that might well have been taken by a drunken fly, only we doubtless flew more slowly and frequently a little higher.

The M1 appeared beneath us, disappeared and then reappeared. Woburn Abbey slid by at a good 15kt, hotly pursued by a mess of unidentifiable aerodromes until, at long last, Edgehill hove into sight on the starboard tip about one Cadet-year away. This was something of a shock, since it should have turned up on the port ➡

tip, but then, when your life consists of a series of highs, very lows and shattering slows in between you just can't be too fussy.

Things now began to get really difficult. A sheet of rapidly thickening high cover was approaching from the south and thermals were becoming more and more dismal. Fortunately, during a perfectly miserable climb from an all-time low, a promising patch of cu started to form over the southern end of Edgehill, and as soon as I judged there was the remotest chance of reaching it, we left our thermal and pushed off at max glide. Now the one really good feature about IT is that any form of speed chart, glide chart or computer is completely unnecessary, since max glide, max cruise, min sink and stall all seem to occur at exactly the same speed.

I will admit that the precise speed for these conditions of flight is difficult to determine, since the ASI needle has long disappeared backwards off the scale; but if a single hair on your head moves you are going too fast, and if you feel a breeze from behind, you may be a trifle too slow. No other indications of the correct speed can be expected. At all events, a final glide ensued, except that by a gnat's whisker it wasn't final. and we were soon grinding merrily away again in ½ft/sec up, some 200ft above the ground.

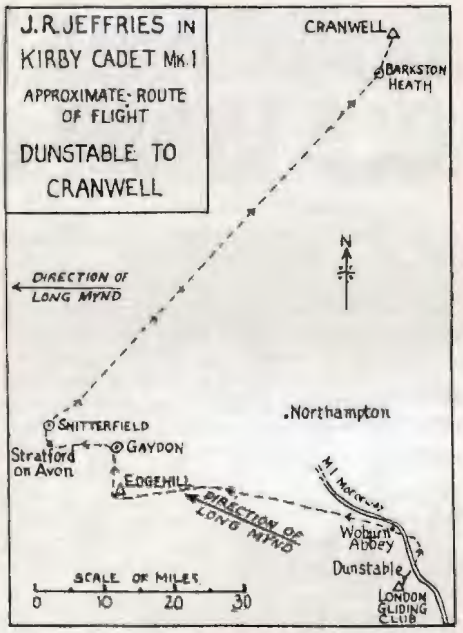
Edgehill was being rapidly consumed by a giant earthwork pincer movement

We slowly drifted past Edgehill, which was being rapidly consumed by a giant earthwork pincer movement, and on towards the end of No. 1 runway at Gaydon, where V bombers seemed to be two a penny. I couldn't help lapsing into the realms of conjecture (Heaven knows there was enough time) as to what would be our fate should a state of National Emergency be declared at the precise moment that we drifted across the end of the runway.

Would we be escorted down by fighters with a stalling speed at least twice as great as IT's max permitted, or would we be dispatched without ceremony with one well-directed shot! I was really quite glad when we cleared the airfield with a more comfortable height margin and the thermal gathered more momentum.

By now a bank of high stratus, which had been approaching rapidly from the south, had reached my intended track and effectively masked the sun. However, there was a "corner" to the cloud blanket and I pressed on in the fond belief that things might be better further west. The actual break back occurred at Stratford-on-Avon, but by this time I could see that the sky ahead was pure blue and not very inviting. Never mind: the river and the Memorial Theatre looked most attractive, and even though this was probably our final glide (apparently now dead into wind), the view was well worth the trip.

During the course of the glide a few new cumulus began to form to the north of track, and we eventually contacted lift at no great altitude



over Snitterfield, achieved a quite acceptable rate of climb, and arrived at cloudbase (I think) at no less than 6700ft – the best height of the voyage. By now the clamp was well and truly overhead and all thought of the Mynd vanished, and the task was converted to a free distance in the direction away from the clamp, *ie* roughly north. But I had left it too late and, unable to overtake the clamp, was soon searching for a suitable landing field. As a last desperate resort I investigated a patch of shadow a lighter shade than the remainder which lay over the village of —? Without daring to breathe, we slowly girated in zero, centred on it and, according to the altimeter, climbed in it until after an aeon we reached 4000ft and hurried off to the nearest obvious lift.

Since by now I had nothing but a purely academic interest in our whereabouts, serious map-reading didn't come into it. But because I thought I recognised a series of small lakes in the vicinity, I made some slight effort out of idle curiosity to check our position, and sure enough I was right to within the nearest 10 miles – we were somewhat north of Northampton, although what had happened to the M1 is anybody's guess.

The next cloud took so long to reach, that it was on the decay when we arrived, so we left again for the nearest, smallest wisp we could see. Unhappily we again were not over-blessed with height, so I kept my eye glued to the little cloud, hardly daring to look at the ground.

Just to be difficult, the cloud sat on the far side of a reservoir, which from 900ft took on the proportions of the English Channel, and it was not until dead mid-stream that a welcome surge raised my spirits. Since at last we had reached the sunlight proper, the thermal was a marked improvement on what we had become used to, and in a matter of minutes we were looking down proudly from cloudbase.

Off once again, we pursued our roughly northerly course on the descents between climbs until I suddenly became aware that we were not only maintaining a northerly heading but also a northerly track. However, I was lost once again, so it didn't really matter. All I knew was that I was not going downwind again, which was very satisfactory. Casually I glanced down at an airfield as it slid by at a snail's pace far below, and observed, I thought, that the windsock pointed towards us. Perhaps I had not seen correctly – I dismissed it from my mind.

Another airfield hove in sight, and here gliding was in progress. Everything looked horribly uniform and, concluding it must be an RAF club, we sailed over their winch in fine civilian style, observing also that we really were flying dead into wind. An Olympia was launched almost beneath us and began circling a few hundred feet below. Since we were at the end of a short cloud street, I elected not to join him and pressed on upwind until we found a really meaty piece of lift which rushed us up to cloudbase. Much to my unsporting delight, I saw that the Olympia had failed to soar and had landed, not once but three times.

Then I was on what was definitely my final glide over Barkston Heath, although I didn't know it at the time, still into wind – on toward a large aerodrome with parched-looking grass around the runway. The closer we got, the more convinced I was that this was Cranwell. There is, after all, only one aerodrome in the country that looks like Cranwell – Cranwell. The next cloud was a good twenty miles away with clear blue sky in between, so that there was really little hope of our journey continuing, so I amused myself by flying locally over the College buildings until finally we ran aground in front of the old control tower.

There followed a pleasant though rather distracting wait due to thunderstorms and constantly changing wind direction, during which I was royally entertained in the Mess until the retrieve arrived. The excitement seemed to have been too much for poor Peter who, after waxing very voluble during the loading-up operation, curled up in the back of the Land Rover and wasn't heard of again until on the outskirts of Dunstable.

BRITISH SUCCESSES

Julian West (Nimbus 4), who has flown three 1000kms from Fuentemilanos, Spain, has come 4th on the German National Open Class Ladder and Vernon Spencer (Nimbus 2) from Lasham, who gained his 1000km diploma from Fuentemilanos on August 5, is in 5th place. They are also 2nd and 3rd respectively on the Bavarian Regional Ladder.

HISTORIC SAILPLANE GROUP

The London GC Historic Sailplane Group have 25 privately owned vintage gliders, 15 of which were designed or built before 1939.

Laurie Woodage and Murray Hayes have bought the ex-Royal Navy Grunau Baby 2B and Ted Hull is building ailerons for his Rhönbuzzard from 1935 Schleicher drawings.

Richard Clark's video incorporates prewar footage and contemporary shots of the vintage scene on the Downs.

Mike Challinor

THE BGA POST TASK

Getting more from racing tasks. An explanation of the new POST rules in the BGA's 1992 Competition Handbook

Post tasks (Pilot Operated Speed Tasks) were introduced after the Australian World Championships to try to reduce gaggle flying, which was seen as dangerous and reducing the fairness of competition.

Pilots flying POST tasks were given a large number of TPs to choose from, then had to fly as far as possible round the points chosen within a given time. Scoring was based on a simple pts/km and km/h system, with heavy penalties for using slightly more or less than the allotted time.

POST adds a new skill to competition flying with pilots having to decide where to fly. It reduces gaggle flying, but this problem can be better dealt with in other ways. However, past POST systems have given enormous penalties for miscalculating the finish time which makes them more like a time trial than a glider race.

Against this background, the BGA Competitions and Awards Committee has developed a POST scoring system which keeps the desirable features of POST (the ability to make more out of a good contest day) without burdening pilots with its undesirable features (*ie* anything which distracts the pilot from making the most from the day's conditions).

What does POST offer?

A POST system should allow pilots to make more out of a good racing day than is possible from a fixed task. The fastest pilot in a racing task flies for the least time! If pilots can see conditions are better in one direction, POST allows them to go there.

POST demands extra skills of pilots. They have to adjust their flights as the day develops, testing their ability to judge conditions and forcing them to be aware of more than the sector directly ahead of them.

POST must be compatible with the current scoring system, not distorting a contest by one POST task dominating the scores. It must also be simple to administer and to fly. In particular, pilots must be allowed to concentrate on flying the glider quickly in the best conditions. Their score should not depend on their ability to second guess other pilots' decisions or make calculations in the air.

The reasoning behind POST

Developing this system has been a long, complex process. Below I have listed a few of the issues considered and how they were resolved.

The first problem was how to avoid pilots having to clock watch. This we achieved by giving no penalty (but also no advantage) to pilots flying more than the task time. Best scores can be achieved by flying for the set task time or over, and do not rely critically on timing the flight accurately.

The next was to make sure the scoring system was compatible with standard racing tasks. After trying various methods of scoring, we finally settled on one very similar to the racing scoring system. This benefits from the well developed way of handling devalued days, non finishers and adjusting the split of speed and distance points.

The third major input was to reduce the burden on pilots in the air and organisers on the ground. The key ways of doing this are by limiting the number of TPs, giving guidelines to task setters on setting POST tasks and using a simple, well understood scoring system.

How it works

Before the competition begins, organisers will publish Ordnance Survey maps showing each TP with its sector marked on. Sectors are defined by centre line and 45° either side, with the centre line chosen to point roughly away from the site and to make photos easy to take and assess. There will be 20 to 30 TPs, possibly arranged in groups of four or five. Pilots can prepare a map before the competition, especially for the POST days.

On the day of the contest the organisers will declare which TPs are not available, counting out individuals or whole groups for airspace or weather reasons. They will also declare up to two compulsory TPs (*ie* first and/or last TPs) and the day's task time, about 2hrs less than the expected duration of thermals.

Once all pilots are launched, they can select their own start time. They must then fly round the compulsory and up to five optional TPs selected from the 15 to 25 available on the day. No TP can be used twice. Typically, a pilot may plan a triangle or quadrilateral, then if they are ahead of schedule, use another one or two TPs on the way back. A pilot may take more than five TPs, but must declare which he is claiming when booking in.

If pilots use the full task time, they are scored for their actual speed and for distance proportional to the task time (*ie* if a pilot flew 450km in 4½hr in a 4hr POST, he gets 400km marking distance).

For pilots who use less than full time, their "speed" is the distance flown divided by the full task time (so if he flew for 3hrs at 100km/h on a 4hr POST, the marking speed is 75km/h).

For non finishers, the pilot must declare which TP he was flying towards. Flown distance is calculated round the TPs claimed plus the final leg distance radiused back from the pilot's declared next TP. If he has exceeded the task time, his scoring distance is reduced as for finishers. Non finishers get no speed points.

Scoring

The total day points are limited by the proportion with scoring distance greater than Y. Y is a fixed speed times the task time (30km/h for Regionals, 45 for Standard and 15M Class Nationals and 50 for the Open Class). Y must also remain within its current minimum and maximum limits.

The ratio of speed to distance points is calculated by the number of finishers, as at present. If everyone finishes, 75% of points are for speed, reducing in proportion to zero for non finishers.

Points can be limited by maximum pts/km as at present. They are calculated by multiplying scoring distance by the day's points/km. The day's points/km is the smallest of:

1. Maximum pts/km for the competition.
2. (Day's Max distance points)/(fastest finisher's distance.)
3. (Day's total points)/(greatest scoring distance.)

This means that a non finisher can win the day, although this is still very difficult to do. It stops the system failing if one pilot comes home very early but no one flying the full time can get back.

The fastest finisher get the maximum day speed points. All other finishers get speed points in proportion, dropping to zero for finishers with less than 40% of the winner's speed. We have set 40% rather than the fixed task 50% to compensate for distance points varying between finishers, which would otherwise make POST days have a wider spread of points. In this way, we keep the scores more closely compatible with fixed course tasks.

This scoring system is very similar to that for fixed tasks. Therefore we get dual advantages of compatibility between different task types and the benefit of years' of development of the fixed task system.

When to use POST

This is a very important point. Because POST assesses the pilot's choice of where to go, he must be able to make an informed choice.

That means that POST should only be run when the weather is reasonable (a reliable minimum of 4hrs good soaring) and visibility is good (20km or more).

It is not a task setter's cop out for bad weather, as on these days no one, including the poor pilot, knows where to go. Thus it is much fairer to send them all on the same course.

Does it work

In developing the system, I have experimented with many sets of actual and invented data. I think the most appropriate data came from ➡

Ameriglide, when the winner flew 119km/h for 4hrs. Another pilot achieved 114km/h but came 9th, (behind pilots achieving 105km/h) because he flew for 20min over time.

On this system, he comes 3rd. His only actual penalty is adding to the risk of slowing down towards the end of the day. In fact, if you can increase your average speed by flying for more than the task time, you will improve your score!

Conclusions

POST allows pilots to fly in the best weather and if it gets better they can fly further! It allows us to be less dependent on the Met man's best guess of what the future holds. It allows slow pilots an equal chance of getting back. It adds the skill of choosing the best weather to that of flying through it efficiently.

We have taken the best of what POST offers and combined it with the well developed 1000pts system. We have made it easy to run and simple for pilot to fly.

We have worked hard to get the BGA POST right first time. So far we have worked on the theory, but this coming season the Inter-Services Regionals, and maybe Handicapped Nationals, will use it in practice. I believe that the theory is right, and I hope it will combine with the pilots and the weather to give POST a good trial.

UVALDE RETROSPECTIVE

Justin Wills, who came 8th in the 15 Metre Class, gives a pilot's view of the World Championships, discusses the POST task and describes the final day

A good contest requires above all, good weather, a good site and good task setting.

Uvalde weather. During the four weeks we were there it was soarable every day, and all but two provided stronger conditions than any found in the UK. The winds were generally south-easterly, 10-15kt, which gave the airmass a passage of 200nm over flat terrain from the Gulf of Mexico. This resulted in very high humidity and some mornings started overcast with low stratocumulus. However, by 10am this was broken up by the intense heating (28° latitude) and at midday cloudbase would be around 4000ft agl (Uvalde is 940ft asl) providing lift of 3-4kt. The winds caused extensive streeting, and by 1500hrs on the best days there were 5/8 cu at 8000ft agl and predictable 8kt thermals with some stronger cores.

If you think this sounds like Paradise you are almost right, but World Championships are about establishing differentials, and it is no use feeling pleased with an average speed of 135km/h if the winner does 10km/h more. Thus is was important to analyse the problems posed by the conditions and seek the best way to overcome them.

First, the long cloud streets with large areas of lift meant one had to fly very heavy; I doubt whether anyone in the Standard and 15 Metre Classes was flying below 500kg AUW, and the Open Class were certainly at their 750kg maximum. The difficulty I found with this was the much reduced feedback from the airframe; it was almost impossible to sense a good thermal and one had to rely heavily on instruments with their lag due to airframe inertia. This was made harder by cruising speeds of over 100kt and many apparently strong surges proved too broken and narrow to be worthwhile, given circling speeds of around 55kt.

Secondly, conditions cycled quite fast, especially early in the day. The area immediately around Uvalde tended to develop later than elsewhere, and start time could be critical in determining a swift transition from one area to the next and establishing the all-important rhythm of the flight. Often the best looking clouds were a disappointment, as one was just too late; sometimes a rather unpromising wisp provided excellent lift. As a general rule it did not pay to get below 2500 agl, and it was worth diverting considerably from track to follow lines of cloud in search of the best lift and minimal loss of height in the meantime.

Another phenomenon that occurred on several days was a change of airmass in localised areas resulting in weaker lift and lower cloudbase, or even blue holes. I never understood the process that caused this change; Wally Scott suggested outflow of cold air from distant cunims, but it was certainly more complex than that. It tended to occur from mid afternoon onwards and it was important to recognise it and slow down. One of the commonest mistakes was flying too fast into such areas, anticipating strong lift that was not there.

Finally there was the sea breeze effect, the joker in the pack. Despite onshore winds the intense heating regularly produced a convergence line starting along the coast and working inland at up to 25kt. This generally took the form of a solid line of towering clouds aligned with the wind but advancing from the east at up to 25kt. In its mildest form it produced scattered showers and lift over wide areas. However, by the time it approached Uvalde it was usually in its advanced state with a low level gust front producing winds of up to 50kt, thunder, lightning and heavy bursts of rain. Uvalde seemed to be near the western limit of its travels and it would grind to a halt nearby.

"The 15 Metre Class had a POST task that day and could try to exploit it"

The Met man predicted it fairly accurately and the fixed tasks were set to avoid it. The exception was on Day 7 when it arrived earlier than expected and cut off all but three of the Standard Class along with the whole of the Open Class. The 15 Metre Class had a POST task that day and could try to exploit it.

I was slow to spot its arrival in the task area having been lured to the west by good looking conditions that were, in fact, decycling. I therefore did not contact the front until it lay 10 miles east of Uvalde, stretching north-south. Its advancing edge looked like a series of fingers

poking westwards. Initially I found only weak, wide areas of lift as I cruised south, but eventually 6kt arrived to cloudbase at 6000ft.

At that point Chris Garton joined me and we set off towards the Big Wells TP (code named "Big Martyn") which lay in an indent between the fingers. We had a reasonably good run in to the TP, arriving just before the rain curtain, but as we turned to retrace our steps we hit enormous sink. Clearly the air had changed dramatically since a few minutes earlier. We altered course to due west and flew towards the nearest sunshine, noting a great cloud of dust ahead. There didn't seem to be much choice except to keep the speed above 100kt and watch the altimeter unwind at 1000ft/min.

Finally I reached the dust at 1900ft, charged through it and felt an enormous heave. I pulled back until the glider was nearly vertical, while the vario whisked round to 1600ft/min up with accompanying *g* that made my transmission to Chris rather falsetto. Back at cloudbase I then had a good run to the north-west which brought me overhead one of the final compulsory TPs. At this moment Uvalde declared it had 50kt winds, a dust storm and was unlandable. I reckoned that this must indicate the passage of the gust front after which there should be a short lull before the rain arrived. so despite having an hour in hand I decided to return on the basis that it might soon become impossible to get back, and the penalty for outlanding on a POST task was prohibitive.

I think this was reasonable strategy, but in fact the front slowed down and Uvalde remained open for a further 45min after my arrival. Thus I came 8th with 635km at 139km/h, whereas the winner covered 727km at 147km/h; nevertheless nearly a quarter of the 15 Metre Class landed out, including the redoubtable Karl Striedieck (USA).

Uvalde Airfield. With a 7000ft main runway, parallel paved taxiway and two further cinder taxiways plus most of the grass areas between, Garner Field would, in the UK, be more appropriate to a city the size of Birmingham than to a small town like Uvalde with 14 000 inhabitants. Thanks to its size and an arrangement whereby it was closed to all other traffic during soaring hours it proved an excellent site. Launching 114 gliders took under an hour with each sailplane having its own tow rope laid out in advance. Finishes were invariably from the south, and often closely spaced, up to 22 gliders within 2min. It all worked well, aided by Charlie Spratt's excellent finish line management.

In addition, immediately east of the airfield lay the South West Texas Junior College which provided an auditorium for briefings, an air conditioned classroom for each team, cafeteria, and budget accommodation all beautifully laid out with excellent parking.

Finally there were the Uvaldians themselves who showed quite extraordinary support and enthusiasm for the contest and its participants.

Uvalde task setting. From the pre contest bulletins we learnt that task setting would be performed by a committee of three aided by a specially programmed computer. Thus all the assigned tasks were based on the calculated length of the soaring day, the average speeds anticipated and then set into the best forecast soaring area. With very predictable weather this resulted in fairly large tasks and compressed starting times. The latter led to a lot of gaggling in the Standard Class, a problem which mysteriously does not afflict the 15 Metre and Open Classes. The percentage of landouts was very low (except on Day 7) with the pilot finishing 31st overall in the 15 Metre Class having completed every task. On Day 5 every 15 Metre pilot completed the 618km task with speeds ranging from 142km/h to the slowest at 120km/h.

Justin flying his L-6 over Uvalde.

The great novelty was the POST task set on five out of the 12 days for the 15 Metre and Standard Classes. The concept appeared fairly simple: a time limit was set, together with a choice of any of four final TPs. Within that time limit points were allocated on a straight line basis, divided 50% for speed and 50% for distance, with the TP rules similar to a cat's cradle, *ie* no shuttling between the same two points, except that Uvalde could be the penultimate TP before finishing. A substantial penalty applied if the time limit was exceeded.

The following interesting points emerged from the results:

1. Pilots flying the POST task exceeded the speeds of the other Classes flying assigned tasks on that day.
2. There were a higher percentage of landouts on POST tasks with the exception of Day 7, when it was very much the opposite.
3. The spread of points on POST tasks was greater than on assigned tasks.
4. I was most surprised by my abillty to use the time limit accurately: on three occasions I arrived with less than 90sec to spare; on the other two I elected to return early.

The task seemed to be unpopular with the majority of the contestants. Its proponents pointed out that it reduced gaggling, increased safety, and allowed pilots greater freedom of choice and the exercise of a greater range of skills than an assigned course. Its detractors claimed it involved too great a luck factor, and was less interesting because you could not gauge your performance in relation to other competitors during the flight.

I sided instinctlvely with the task's supporters, but felt that its major flaw was lack of clarity regarding what it was trying to measure. The rules indicated a need for conservatism – a landout would cost at least 500pts, even if only one pilot in the Class completed the task; the speed and distance points were not geared to the number of finishers. Likewise the penalty for flying overtime was prohibitive. However, what was impossible to calculate was the distance versus speed equation: the points per kilometre depended on the time limit set (varying from 3hrs to 5.5hrs), whereas the pts/km/h varied according to the day winner's speed.

I found trying to juggle with the possible ratios during a flight in order to decide whether to return early with a certain speed, or continue increasing distance but at a reduced average speed an impossible and frustrating exercise. Thus I tried to fly conservatively and cover the maximum distance within the time limit. This worked fairly well in the predictable conditions at Uvalde (I won one, and was 8th or better on three of the others), but it could prove quite inadequate in other environments and result in a very high luck factor.

On reflection I believe the POST task should be divided into two.

a) Speed only POST. A minimum time limit should be set, a series of TPs allowed, excluding shuttling, and the winner is the pilot with the fastest average speed around the course of his choice whose total time exceeds the minimum time limit. Those finishing early would be assessed as having flown the minimum time limit, those landing out would be assessed in relation to the average speed of the finishers multiplied by the minimum time limit. Scoring formula would be exactly the same as a normal speed task.
b) Distance only POST. This would be a limited time distance task with similar rules to a cat's cradle. A 2:1 penalty based on the pilot's average speed would be applied to overtime. Scoring would be geared as for a speed task, with a significant bonus for landing back at the start point.

I think both these tasks would work well in a broad spectrum of weather conditions, and would also fit well alongside the existing scoring ➡

system devised for conventional speed tasks.

To be successful at Uvalde required good organisation, the right equipment, correct strategy and being on form.

British organisation. Thanks to Motorola UK the team was well financed, and the special clothing provided, far from being the gimmick I expected, proved ideal for the climate; I doubt whether our team has ever before voluntarily appeared at briefing in matching uniforms! Ben Watson (team manager) did an enormous job arranging accommodation, transport and shipping prior to the contest, and provided his usual excellent back up services during the competition, leaving the pilots to concentrate on their equipment and the flying.

British equipment. In the 15 Metre Class we all flew LS-6s. There were only three other types in the Class. I was concerned that the Ventus, with its higher wing loading, could have an advantage in the very strong conditions but this did not prove the case. Several of the Ventus had sprouted US built winglets which clearly contravened the rule requiring that each aircraft must be certified in its country of manufacture. However, since it was generally felt they did not improve performance, apart from handling qualities when fully ballasted, and because nearly half the teams had them, we felt a protest would be unproductive, despite the principle at stake. The Polish SZD-56 arrived with its strange appearance and enormous claimed performance; however, it seemed no better than the rest, whilst the ASW-20s seemed slightly inferior. There were no DG-600s.

In the Standard Class there were seven types flown, with little to choose between the latest including Andrew's Discus and Dave's ASW-24.

In the Open Class there were five types, including four Nimbus 4s. These seemed to have no advantage over the others in the strong conditions, but looked as if they would be very effective in British weather. The two-seaters, which included Robin May's ASH-25, did not appear competitive at high speed.

British strategy. In contrast to the French this tends to be worked out by each pilot. However, as the contest progressed it seemed that Andy and Dave flew with the most information exchange, followed by Chris and me; Robin had to fly perforce on his own, and Martyn prefers doing his own thing.

My personal strategy was based on the following correct premises:

a) The contest would be flown over the full 12 days.
b) Following the move to Uvalde from Minden there were a very large number of potential winners, not only the French, German, US and British, but also the Poles, Australians, South Africans plus several others if they were on form.

Therefore I resolved to fly steadily and conservatively, aiming to enjoy every flight and avoid becoming stale through too much practice beforehand.

On the face of it this all worked well, with my only problem resulting from landing out on Day 10, when I was just 27pts behind the leader. Had I achieved 9th place that day with 865pts I would have won. However, this is too simplistic; in fact I had been consistently starting too late in relation to my conservative aims. I had got away with it, and even won three days, but on Day 10 it caught up with me. The silly thing was that Chris and I had identified the risk before take-off that day, and agreed to start no later than 1345. Despite that we ended up starting at 1403. The winner started at 1344.

Pilot form. Given that several pilots have the necessary talent and experience, the most intriguing aspect of contest flying for me is the mystery of "form". Some pilots flew well throughout, including Brad Edwards (the Australian 15 Metre Champion) and Stefano Ghiorzo (Italy and 5th in the 15 Metre Class). The French flew probably best of all, but were let down by a couple of lapses. Bruno Gantenbrink (Germany, and 6th in the 15 Metre Class) seemed very aware he was below form, although he looked like a medal winner until the last day. With the placings spread over so few points it is easy to point out those who nearly won, including Klaus Holighaus (Germany, who was almost 200pts ahead in the Open Class after nine days), and fellow German, Holger Back (10pts behind the winner after 12 days). I picked Ingo Renner (Australia) to do well. I think he was uncomfortable with his aircraft, and ended up 6th after a bad last day. Nevertheless, 50pts more and he would have been 3rd.

". . . friendly outgoing atmosphere, with lots of opportunity for introspection and self discovery . . ."

Uvalde provided tremendous flying, an extraordinarily friendly outgoing atmosphere, with lots of opportunity for introspection and self discovery. Above all it was enormous fun right up to the end.

The final day. In the past I had done particularly badly on the last day of World Championships, especially in Italy where I lost a good chance of being 3rd, but also at Benalla and Wiener Neustadt. I was therefore extremely keen to reverse this pattern at Uvalde. After my disastrous performance on Day 10, with nothing to lose, I was determined to give it my best.

The task was a 429km quadrilateral to the east and south. The Met forecast was for 6kt thermals up to 7000ft agl, no sea breeze activity but some scattered showers with a maximum temperature of 37°C and winds of 165/12kt blowing diagonally across the course. Take-off was set for 1215 with a latest permissible start time of 1500hrs. Clearly the task setters had abandoned their computer programme to get us back early so they could calculate the final results. At last we had a real race with plenty of choice of start time.

As usual conditions were only moderate at first, with 3/8 cu at 4000ft, but shortly after release I detected signs of wave activity, presumably triggered by wind shear at the inversion height. A switch to the US frequency revealed discussions utilising the impenetrable code word "surf", and although I felt sure it would prove irrelevant to the task I spent the next hour slowly climbing above the clouds to 6500ft agl, to be rewarded with a good view of conditions developing along track. There were no signs of the predicted showers, but conditions continued to improve steadily, with streets forming to the south-east.

From 1400hrs onwards gliders began to start, whilst the inversion continued to rise to my level. By 1440hrs there was just myself, Chris Garton, the two French, Obermeyer from Germany and Jan Andersen from Denmark left. We all circled interminably in ½kt at 6700ft as we drifted nearer the starting zone. Finally I straightened up, to be followed instantly by the others except for Jan. Five LS-6s flew very nose up at 65kt to the start point, dipped their left wings for the photo and the race was on.

At a cautious 90kt we flew towards the first short cloud street, turned along it, pulling up in the lift, before turning crosswind and diving to the next. This produced 7kt and we climbed back to 6000ft. Already the others were level with me and on the next run I began to fall behind. A series of zig-zags brought us to the next thermal where I was 500ft below.

By now we were cruising at 105kt, and the following glide took us into an area where the clouds looked less promising. Nevertheless we ploughed on down to 2500ft where Gilbert Gerbaud (France) found 7kt on the south-eastern side of the cloud, which was most unusual. Further to my surprise he left it, followed by the others, at 5500ft when it was producing 8kt. I stayed for two more turns, and then used the four in front to plot the best glide path to the first TP, which I reached in 40min from start, having covered 90km with no height deficit, despite a 5kt headwind component.

The track of the second leg lay closer to the wind, but involved crossing an area in the lee of a large lake. The gliders in front of me turned across the streets and I watched as they pulled up under the first street, and dived on to the second before turning to fly upwind along it. They did not appear to be finding much so I used the first street, which proved considerably better. When the leading group next stopped to circle I was able to join them 700ft above.

The course ahead was well marked by obvious clouds and conditions improved as we crossed on to drier land and approached the second TP. Just to the north lay a very dark edged cloud with several gliders marking the strongest areas of lift. Gerbaud and I circled up to cloudbase in 8kt, flew along the street until we were level with the TP, and then dived towards it at 110kt. The 130km had taken an hour, with a 10kt headwind.

On the third leg I again used the streets to fly towards the centre of the task area, and then dived across them back on to course. With a quartering tailwind I took one 8kt thermal after 50km and arrived near the final TP at 4000ft. Here the clouds looked excellent but I was unable to find a strong core. I reasoned that the conditions had just peaked and cautiously took 5kt; this proved the right decision as I watched the others charge on and get very low. Gerbaud was still just below me as I rounded the final TP, with Martyn Wells a little above. Another 115km in 50min.

The homeward leg lay almost at right angles

to the wind. I had caught up a lot of other gliders by now, and after crossing two streets I found Ghiorzo climbing in 5kt under the third, Gerbaud followed this downwind in search of something better, whilst I stopped and climbed back to 5500ft before setting off directly towards Uvalde. The clouds looked weaker, but I could see dust devils rising from the ploughed fields below them and pressed on hopefully. To my right and a little below I could see Doug Jacobs (USA) doing the same.

With only 40 miles to run I set the Cambridge S-NAV into final glide mode. We quickly found 5kt under the next cloud and at 5500ft the excellent S-NAV indicated we were on glide path, albeit without a safety margin.

The calculated cruising speed was 100kt, but I believed I could improve on this by following the cloud pattern ahead and opted for 110kt. Initially the glide seemed discouraging, due to the loss of height incurred whilst accelerating, but thereafter it stabilised at 500ft below height required. Doug Jacobs was 500yds astern as we crossed the 20 mile radius at 3000ft. Suddenly I saw three buzzards circling tightly a mile ahead and just above. As I approached I pulled back hard and the next moment there were birds diving frantically across the canopy as the LS-6 sailed upwards with its varios showing good lift.

A strong pushover with its negative *g* and the glider was back up to 110kt and now exactly on glide path. As the airfield approached I aimed at the edge of the scrub two miles short and let the speed build up accordingly before flattening out across the tree tops. Then down to 20ft for the final charge across the line, 429km in 3hr 5min, giving 137km/h.

"Good finish, No. 1; good job"

Charlie Spratt always spotted the day winner.

VINTAGE GLIDER RALLIES

There were two International Rallies last season – on the Wächtersberg in Germany from July 6-12 and at Schaffhausen in Switzerland from July 13-19.

At the Wächtersberg in the Black Forest, with 23 gliders entered, Ian Smith and Vic Marshall flew a T-31 to over 9800ft asl in thermals while at Schaffhausen the 47 gliders often totalled more 100hrs each day, largely helped by hill soaring.

At the Swiss Rally a Czech Orlik 2 and Lŭnák were entered officially for the first time, the latter showing itself to be a sensational aircraft with excellent soaring capability as well as being fully aerobatic when new in 1949. Fowler flaps ensured an excellent performance at low speed with its 14m span.

Of the 73 built, six are in museums and of the other two only one is airworthy. Before, when the Lŭnák was with us, it was in secret! It was to be a trainer for Mig 15 pilots.

A WLM 1 1947 Swiss aerobatic glider was also present for one day and in perfect condition. It was to have been a trainer for Swiss Vampire pilots.

CHRIS WILLS

JUMP OR BUMP

Part 2

For the second of his three part series (see the last issue, p310), Tony Segal writes about spinal injury, undercarriages and seat harness

Bad backs, or the "big B". If you go to the canteen of any gliding club, you will soon realise that injured and strained backs are a major problem among the pilots. Ullrich Kopp, a member of the German LBA (equivalent to our CAA) in Braunschweig, has analysed accident figures in Germany for the period 1973-1990. He found that while the total number of accidents has decreased, the number of heavy landing accidents has increased. An amazing 94% of these heavy landing injuries affected the spine. A large number of heavy landings involved training two-seaters and early solo type of gliders.

Undercarriage. Both Ullrich, and Gerhard Waibel (Gerhard is the glider manufacturer's representative on the OSTIV Crashworthiness Sub-committee) were concerned that present design requirements for undercarriages were actually increasing the risk of back injury. At the present time, as a sprung undercarriage reaches the limit of its stroke in a heavy landing, it comes to a sudden stop. A heavy load is thus imposed on the pilot's spine. It was suggested that at the extreme of undercarriage stroke the surrounding structure should break in a controlled manner, thus reducing the shock to the pilot's back.

Undercarriages have been steadily improved, with bigger wheels and tyres, longer stroke and improved shock absorption. It was proposed that a dangerous area was being entered, where the resonant frequency of the system was close to the natural resonant frequency of the human spine. However, I feel this is not so, and the information has been misunderstood. It is clear a lot more work needs to be carried out on undercarriage design.

The cockpit. The requirements in the cockpit to help safeguard the pilot's back are well established and draft OSTIV Airworthiness Standards were drawn up at Uvalde to cover these points.

First, *the back must be fully supported* by the seat back and the parachute pack. A parachute pack ending half way down the spine will give a stress concentration at that level, at which a spinal fracture may occur.

Next, *the natural curve of the lower (lumbar) spine* must be maintained by the use of a small firm lumbar pad, placed between the pilot's back and the parachute. The original experiment showed that the spine fractured at 10*g* (under the conditions of the experiment), but 18*g* was required to cause fracture when a lumbar pad was used. This simple pad must be the most cost-effective measure ever! Incidentally, do not use an air inflated bladder for this purpose. It will cause rebound on impact, and will get harder at altitude.

Last of all, the pilot should never sit on soft *seat cushions*, as they amplify the crash acceleration. It is quite all right to sit directly on the seat, although it may get uncomfortable. Special seat cushions are recommended; the foam involved is called by a variety of names – energy absorbing foam, long-memory foam, high hysteresis foam, low resilience foam. I carried out tests using a full size pilot manikin on the test track at the RAF Institute of Aviation Medicine, on Dunlopillo low resilience foam. On impact, there was a low rate of rise of *g*, a low peak of *g* and an absence of rebound. This foam was obviously good stuff – unfortunately, glider pilots at the time could not be bothered to buy it, so it has gone out of production.

An experiment on seat cushions was carried out in the USA at the Wright-Paterson Air Force Base. They concluded that soft foam cushions should not be used. They tested an American type of foam, and found it neither decreased nor increased the input acceleration, but it greatly increased seating comfort on long missions. The use of the foam was recommended for operational use in the A-10, the F-15, and the FB-111.

Further research is under way at the present time, by Martin Sperber at TüV Rhineland and Jeff Lewis at the Schweizer Aircraft Corporation, USA, on energy absorbing seat cushions.

It is vital the seat cushions are firmly attached – if they slide forward they could prevent full movement of the control column.

Martin Sperber is also working on the design of an energy absorbing seat pan.

Head rests. Tests on a pilot manikin by Martin Sperber showed that on impact the head jerked forward until the chin met the chest and then jerked violently backwards. The head experienced 40*g*, but because of the very short duration this need cause no injury to the skull or to the brain. The Crashworthiness Sub-Committee drew up draft OSTIVAS to cover a suitably strong ➡

head rest to be faced by energy absorbing foam. Where possible, the head rest supporting structure should be integral with the seat back. There must also be no possibility of the parachute catching the head rest during an emergency exit.

Seat harness and "submarining".

The seat harness is a neglected but vitally important part of the glider. It has two functions – to hold the pilot in place against in-flight loads (including negative *g*), and against crash impact loads. For gliders with an upright seating position, such as the K-13, a four point harness (two shoulder straps and two lap or pelvic straps) is adequate. However, for a low profile glider, with the pilot in a semi-recumbent position, something more is needed to prevent submarining.

Submarining is the term used to describe the motion of the pilot if he slides down and forward under his seat harness. This is a thoroughly bad thing to occur, for the following reasons:–
The feet and legs may be injured.
The groin may be injured on the control column.
The lap (pelvic) straps will rise up on to the abdomen and may damage the organs. (The lap straps should press on the hard bony pelvis.)
The harness quick release fastening (hereafter called the QRF) will rise up, causing the shoulder harness to slacken off.
The slack shoulder harness allows the spine to bend forward, so increasing the risk of spinal injury.

The classic and simplest method of preventing submarining is to have a fifth strap, the negative *g* strap, passing between the legs and anchoring the QRF in position. This is used in military and aerobatic aircraft. This makes a five point harness. There are some objections to this harness. Inevitably, it is more complicated to put on and remove. Passing urine during the course of a long flight may be difficult. The groin region may be injured on impact, but surely far less so than by striking the control column. Gerhard Waibel has pointed out that the fifth strap is fastened to the relatively weak join between the left and right halves of the fuselage. Also, if the fuselage becomes oval in shape on impact, the fifth strap will become slack.

An alternative is to use a six point harness, with two negative *g* straps passing between the legs. The two negative *g* straps can be joined by a common yoke, to simplify attachment to the QRF.

The adjustment buckles should have minimum "micro-slip", so that the harness does not become slack in flight. The buckles should tighten the harness by a pulling action towards the pilot.

The QRF should have the following properties:–
A double-action operation, to prevent inadvertent opening.
It should not open under shock load. (Some types of fastenings do so!)
It should be operated one-handed.
It should be possible to operate while under *g* load.
Once opened, it should remain locked open. Otherwise, the pilot may be trapped in a partially released harness.

The attachment points of the belt should be strong enough to take the design load.

The shoulder straps should pass backwards either horizontally, or at a slight downwards angle. This may be difficult to achieve with pilots of different size. The two straps should be a suitable distance apart horizontally.

The lap (pelvic) straps should pass vertically downward, or backwards as far as 20° from the vertical, from the H point. The H point (the hinge point) is the pivot between the torso middle line and the thigh middle line of the pilot.

Martin Sperber has demonstrated an entirely different method of preventing submarining, by using a steeply raked seat pan with a correctly positioned four point harness. I feel this needs further investigation, namely, checking with small and large pilot manikins, checking under conditions of negative *g* and checking with the seat harness slack. I am also concerned in case the steep rake of the seat pan increases the risk of deep vein thrombosis developing in the legs of the pilot.

Loose objects. Thanks to the efforts of Alan Patching (Australia), new OSTIV Airworthiness Standards have been approved to cover the secure fastening of batteries, barographs and similar objects. It is clear that radios and cameras that are frequently placed loose in the cockpit present a serious hazard to the pilot in the event of severe mid-air turbulence or a crash landing.

Failure of a Grob 103 cockpit sill in compression. Note: the tail broke off.

Failure in tension of transverse bulkhead attachment to the cockpit side wall.

Delethalisation of the cockpit. Sharp edges or protrusions in the cockpit area should be avoided if possible, or else covered with firm foam.

The effect of a heavy landing. The photographs show the typical effects of a very heavy landing, when the impact is on the nose of the glider. The cockpit bends upwards, causing a failure in compression of the cockpit sill. The fuselage cross-section becomes oval in shape, causing a failure in tension of the join between the transverse bulkhead and the cockpit wall. These controlled failures absorb energy, so helping to protect the pilot. The pilot, who was wearing a five-point seat harness, had only minor injuries.

In the next issue Tony will be writing on emergency escape from the cockpit. ■

CAUCASUS TRIP

The Soviet travel agency Kavkaztou Business, which specialises in travel for sport, is advertising trips to the aeroclub at Vladikavkaz, situated near the Caucasus mountains. At least five or six people are required before a trip will run. *Segelflygsport* (Box 90011, 54102 Skovde, Sweden) has the details for anyone interested.

FLYING THE NIMBUS 4

Julian West, who has flown three 1000km in his Nimbus 3 (see the April issue, p87), approves of this newcomer

It's difficult to refuse an invitation to fly the latest *non plus ultra* of the Open Class, particularly as I have been itching to get my hands on it ever since I saw the first one under construction in 1990. Although the Nimbus 4 is an entirely new glider, it follows on from the Nimbus 3 and to save repetition any unqualified comparatives in this report refer to the Nimbus 3.

General description

The Nimbus 4 is a strikingly handsome glider with a pointed nose, a large raked-back fin, a high aspect ratio tailplane and long slender wings curved like sabres. The formidable 26.4m wingspan gives an aspect ratio of 38.8. Uniquely, both the leading and trailing edges of the wings feature multistage sweep-back, and to keep the tip vortices away from the ailerons the wingtips are cranked upwards in two dihedral stages as well. The wing roots are neatly faired into the fuselage. A 3.1m span tailplane also features a swept-back leading edge, but in only two stages.

Wingtip skids are formed by triangular metal plates bolted to the distal ends of the outer panels. All cockpit controls are laid out as for the Nimbus 3, with the airbrake and flap levers on the left and the undercarriage lever on the right. A new seat-back can be adjusted fore and aft at the base and pivoted in flight. Cockpit access is improved by an instrument panel that rises with the forward-hinged canopy.

Lower control forces result from using the aileron drives and fin/rudder design of the latest Nimbus 3D. There are [1]spoilerons on the wingtip extensions, which are mechanically linked to the rudder rather than the ailerons, and which extend 80° upwards whenever full rudder is applied. By counteracting the high aileron drag moment that is inevitable with such a large span, these allow the full power of the ailerons to be used. The enlarged top surface airbrakes are linked to the flaps when set positive and lower them to 40° when fully extended. This steepens the approach without increasing the touch-down speed.

The wheel brake can be operated either by a lever on the stick or by extending the airbrakes fully. A larger main wheel gives good ground clearance. To support the higher 60kg tail load, which is due to the swept-back wings, a tail wheel is fitted as standard. There are four easy-fill ballast tanks, which take a total of 300 litres, and a fin tank for C of G correction. Although apparently identical to those on the Nimbus 3, even the inner wing panels have a modified lower surface to improve performance at high speeds.

Handling

The pure glider weighs in at 470kg empty, but I flew the self-launching version, which is 90kg heavier, at a wing loading of 36kg/m² (7.4lbs/ft²) on aerotow using the nose hook. The cockpit was roomy and exceedingly comfortable with excellent forward vision, even with the tail on the ground. To improve aileron control at low speeds the flaps are initially set to –1 and later lowered to +1 for take-off.

Although the Hahnweide runway is grass and a light crosswind was blowing, there was no tendency to weathercock, which is one advantage of a high tail load. Once airborne the glider's stability made keeping station on tow very easy. The main wheel was harder to raise until lightened with a push-over to reduce the loading.

Although heavier than the other versions, the Nimbus 4M still remained safely controllable down to 80km/h (44kt). On reducing the speed further, the nose rose until at about 70km/h (39kt) there was a docile stall with a gentle nose drop. There was no tendency to mush downwards nose high or to drop a wing. With the ventilator closed the glider was completely silent, apart from a faint swishing sound that grew slightly louder at high speeds.

The controls were both light and well harmonised, being similar to the Nimbus 3D. The ailerons were very effective in all flap settings, and the rate of roll was remarkably high. It didn't run out of rudder at full aileron deflection, no doubt due to the spoilerons. It was very easy to keep the yaw string in the middle, even when rolling from 45° to 45° in under 6sec. Once established in a turn the aircraft was stable and required little correction. Indeed, I have never flown such an easy and pleasant glider.

It was late afternoon in October and the sun shone weakly through a thick layer of cirrus. The sky looked dead, but there was a light north-easterly wind and I flew low over a ridge that had been severed from the meandering escarpment of the Swabian Uplands (Schwäbische Alb). At one end of this ridge, the tower of Teck castle stood proud of its thickly wooded slopes. Near the cleavage at the other end there was a small area of weak but usable hill lift, which enabled me to simulate some thermal climbs.

The Nimbus 4 photographed by Peter Selinger.

The wind made repeated centring necessary, which was ideal for checking the handling qualities whilst circling. Even when flying slowly, the 650kg Nimbus 4M felt quite safe and seemed best at around 85km/h (47kt). In the Nimbus 3, unless the thermals were very smooth, I would enter the turn at zero flap, and then use the +1 setting for better roll control at low speeds. However, with the Nimbus 4 this is not necessary as the rates of roll in the positive flap settings are all very good.

The high speed handling was checked on the way back to the airfield. The elevator is less sensitive making the Nimbus 4 rather more stable in pitch. To prevent VNE at 275km/h (150kt) from being unintentionally exceeded, it cannot be trimmed-out above 200km/h (110kt), and be- ➡

[1] A spoileron is a section of aileron that also acts as a spoiler.

yond that forward pressure on the stick is necessary. From a high approach with the flaps set to L the brakes were opened fully. The extra drag of the flaps made it necessary to lower the nose to maintain the speed above the safe minimum of 90km/h (50kt) for the wing loading.

The much steeper descent soon brought me down to the usual glide path. After a conventional landing on to grass using full brake, the flaps were reset to -1 for better aileron control, and the Nimbus 4M was quickly brought to a halt with the wings level by the powerful disc brake.

Rigging

As on the Nimbus 3, the wing is six-piece with a single main pin and single inner/outer panel connection pins. The wingtip extensions plug into the outer panels. There are ten hotelier joints, two extra spoileron couplings and elevator connection is automatic. None of the parts are excessively heavy, the outer wing panels being about 6kg heavier, and with wing stands it is a two-man job in calm conditions.

Summary

The handling of the Nimbus 4 is so good that I doubt that it can be bettered for a glider of this size. If it wasn't for the problem of controlling such a large span during take-off and landing, it would be perfectly suitable for a novice.

The only negative aspect is the heavy tail load, which makes ground handling more difficult. However, with the motor glider version this prevents nose-over when applying full power for take-off.

Any discerning glider pilot who buys the Nimbus 4 will be rewarded by the ultimate in sybaritic soaring. With such a fine machine, I'm sure Schempp-Hirth are on to a winner in more ways than one.

TWO-SEATER COMPETITION

The Wolds GC's Two-Seater Competition at Pocklington Airfield from August 19-25 was the most successful yet with 16 gliders entered and more than 100 crew. There were five competition days and although conditions were far from ideal, Andrew Butler, the publicity officer, said "there were some epic and courageous flights."

The longest task was a 328km double O/R, the competition ending with a win for the Dunstable ASH-25. The prize for best wood went to the K-13 from Derby & Lancs.

It was a very friendly week with credit to Simon Parker, the organiser, and his hard working crew. Many pilots experienced cross-country flying for the first time, while having an enormous amount of fun.

Andrew adds that they are planning another Two-Seater Comp next summer and if there are enough entries there will be two Classes – Wood and Glass.

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

ARIANE DECLOUX

ARIANE AT ST AUBAN

The French National Centre now encourages applications from other Europeans and Ariane was so impressed with her course she has booked another

Here I am recalling the most exciting flying holiday I've ever had. If you remember, last year I spent a few days in Sisteron learning how to start flying solo in the mountains. (See the August issue, p182.) Looking back, I was very easily satisfied, flying above Pic de Bure and the Domaine de la Blanche. Now St Auban is something else ...

In September I went on the Perfectionement Vol à Voile Course at the French National Centre. St Auban runs a range of courses suitable for everyone wanting to learn mountain flying and is the only recognised centre for training instructors and members of the French gliding team. (Applications from other Europeans are now encouraged.) They have an excellent fleet of gliders – Janus, Nimbus 3D, ASW-20, ASW-17, Pegasus, Libelle, LS-1, LS-4, Discus and Cirrus (in non-preferential order).

The Perfectionement Vol à Voile course is extremely intense. It starts at 7.45am with breakfast and finishes at 8pm for dinner, with just 30 minutes for lunch. Most of the morning is taken up with lectures, briefing, debriefing and weather forecasts. So you have very little time to think or even relax. However, it's still the best thing I've ever done.

Right at the start, Pierre Lemaire, our instructor (an ex Nationals pilot) asked Iain and myself what our objectives were, what we intended to achieve and what we felt would be difficult. "That's easy" I thought, "I'm so frightened of losing sight of the club this will be a massive challenge for me." I wanted to understand the *aerology* (sorry no English word equivalent) as well as the techniques used for mountain flying. But most of all, I wanted to prove to myself that I could fly, even under pressure.

So, what did I achieve overall? About 45 flying hours in ten days; a few solo 200km cross-countries; a superb 500km flight to Aosta, Italy, in a Janus with Pierre; but most of all, the freedom to fly into the high mountains safely.

The best memory of this holiday has to be my solo flight to Mount Pelvoux and the Glacier Blanc. This flight took around 4.5hrs and the conditions were excellent. But the transition from the now familiar territory of Dormillouse to Mount Pelvoux was a little more challenging than I had anticipated. When you are gliding at 3000m, still below ridge top and alone in the middle of nowhere, you wonder what you are trying to prove.

I hated the whole transition – I felt very uneasy and despite all the encouragement I got on the radio, I was well aware that I was on my own. At last I could see the Glacier Blanc quite clearly – so close yet so far.

I still had to climb higher and my decision techniques still left a lot to be desired – 3500m +2m/s on the vario was a good thermal which became a good friend when my altimeter started to show 4000m+. It's a pity I didn't have my barograph on. I decided that I had enough height to make the last transition and, as Pierre said, "play about in the glacier."

It's hard to describe what I felt at that moment – I was on the top of the world, I had realised a dream – it was just fantastic. It's a shame we weren't allowed to talk much on the radio, I was just about ready to share it with everyone. After a few moments, I started to realise what I had done; I was at 4250m playing in the glacier; I had made my way there on my own, not without difficulties, but I was there.

The return journey was very easy – the conditions still excellent and I was full of confidence in the glider. For the first time I wasn't seeing myself as a novice. Maybe now I could consider being called an intermediate ... who knows? I decided the visibility was so good I would go and see the Pic de Bure again. Not so frightening now; a little bit more friendly. I met Iain and Pierre there and we took several photos before returning to St Auban.

How did I feel? It's difficult to explain. The experience was quite magical ... I never usually enjoy a flight until I land and give myself time to remember all the challenges and achievements – but this one was different.

In a few weeks I went back to Sisteron and looked forward to working out a few more routes into the high mountains and learning more about the local conditions. And, this year I'll return to St Auban to do the Instructor Preparation Course. So, if you're still interested, I'll let you know how I'm progressing.

(If you're interested in finding out more about courses at St Auban, you can contact me through the Cambridge University Gliding Club.)

FLYING IN THE WORLD CLASS

13.5m span, no flaps and a fixed wheel! Platypus in the October issue, p241, must have been talking about the Tutor assumes Keith Nurcombe who goes on to tell us what devious motives make a cross-country pilot choose such a glider

In 1990 I did a couple of cross-countries in the Tutor. Having picked up a few National Ladder points I decided to record the thing for posterity and duly submitted a few words for the Editor's consideration. You may imagine that I was both surprised and more than a little miffed to receive a rejection slip with the advice that "we have more than enough Tutor articles thank you very much". *(The article came a few days after the account by Norman James, also of Coventry GC. See June 1990, p138 and also December 1990, p301.* ED)

A little while later the Ed relented and suggested that while she could not consider a **Wotidid**, or even a **Howidunit**, the burning issue to you eager readers would be simply **Whyheduzit.** So here it is: What devious motives make a cross-country pilot choose to fly a Tutor?

When I was first asked this question I was surprised to find that I had no coherent answer, unlike Norman, who simply views every flight as an adventure, as indeed they are. But for me, there was more to it than that. It has taken much agonising introspection to work out just why I find flying the next best thing to a barn door so stimulating some thirty years after first getting my feet off the ground.

Bored with flying and frustrated by a failure to achieve much in club gliders

Like others baring their souls in *S&G* recently, I too had found myself getting bored with my flying, and frustrated by a failure to achieve anything much in club gliders. So there are a number of factors, and you will see that some of my motives are far from honourable. If you find it all rather heavy going and would rather have had a Howidunit please send your complaints to the Editor, and not to yours truly.

(First, you must remember that Norm was having a marvellous time.)

1. Needling Norman. (I couldn't bear to see him being bought all that beer.)
2. Needling the brash young hot-shots. (To many of the young members my generation are boring old has-beens. Well, now you've got your Silver in that fancy Discus, let's see you do it in one of these.)
3. Needling almost everyone else. (Been anywhere in the ASH today, Chris?)
4. Nostalgia. Although I never flew a Tutor in "the system" (the club had a high performance Prefect for early solo in my time) the delight of soaring open cockpit on a cracking day is almost unsurpassed (if you can stay up, that is).

Having just re-read this, I can't help noticing that a slight hint of bolshie nature is revealed, along with a general determination to do things the hard way. Perhaps it's just my imagination. My friends all tell me I could charm the birds from the trees.

I belong to the T-21 and Skylark era. It's probably rose-tinted glasses, but much of my flying in the sixties was enormous fun. I was privileged to share a Skylark with a group of generous, successful partners on whom I sponged shamelessly, and to whom I shall be eternally grateful. Racing triangles had hardly been invented, but cross-countries, cloud flying, wave and hill soaring there were in plenty. I left gliding in the seventies, and when I returned in the eighties there had been a sea-change in the sport which had developed enormously. Yet demands of family, home and business made it difficult to compete for the club single-seaters, while duty days tended to occupy what little time was available for my solo flying. So in 1989 I joined *that T-21* syndicate in which Lou Frank and others had achieved so much.

Task week that year was truly Norman's week in his Tutor. First he went to Cheltenham, then to Dunstable, next to Nympsfield, and flew other heroic tasks revelling in the sheer astonishment of it all. Come Wednesday, Day 5 (that was some year too, I seem to recall) Lou and I were thinking that strong measures were needed to redress the balance. We had the T-21 rigged before briefing and declared Lasham, which we reached after an easy flight of some 2½hrs. Norman joined us in his Tutor, so we had the Husbands Bosworth Vintage Soaring Society parked on the lawn outside the clubhouse, as a result of which we were offered another Tutor. Well, to cut a long story short, twenty minutes later my wife arrived with the T-21 trailer and caught me writing a cheque that caused a bit of harrumpping and a few dirty looks. As I explained later, Norman was having such a lot of fun and it can't have been costing him much. Anyway, I can't possibly make one for that sort of money, and if he wins the National Ladder everyone will want one. Martin told me that he had a Kestrel and was addicted to cross-country flying. I didn't tell him that I was too.

Since then, two seasons in Wooden Spoon have put the issue beyond doubt – 1000km cross-country in 1990, and nearly as much in 1991. We've been to Snowdon, and within sight of Sutton Bank (the day cycled, dammit; twenty minutes later it was booming again): Closed circuits that have had us hugging ourselves with glee; O/R to Evesham (142km in 3:42), Husbands Bosworth, Melton Mowbray, Pitsford (105.4km in 2:35) are the high-spots to date, with several epics missed by one thermal (now where have I heard that before).

While rediscovering the joys of flying these blunt nails has been enormous fun, no one could seriously argue that they are better than modern glass ships. Better performance gliders give more available days, get back more often, are incomparably more comfortable and have a much wider performance band: To say nothing of carrying superior payloads into hostile regions. But, make no mistake, an open cockpit on a decent day is not an experience to be sneered at.

We have learned that by applying the soaring and cross-country experience collectively gained over several decades these early gliders will go further and faster than we had believed possible. Some of my closed circuit flights have been as long as, or faster than, those I was flying in the Skylark 4 in the sixties. Just shows how badly I was flying the Skylark! Or maybe we have just forgotten how well the pioneers were doing. It's infinitely more difficult to be the first to do something. Some of the early flights of the twenties and thirties were astonishing, even by today's standards. For me, one element of flying the Tutor is simply a reminder that maybe we aren't doing as well as we think we are.

They will give just as much pleasure as that new glass hot ship you can't really afford

Now for the deep philosophy, folks: As with most things in life, it's not what you've got, it's what you do with it. If you yearn to win the Nationals then you'll need a modern ship. But for the rest of us, all those old wooden ships out there, many of them canopied, with dive brakes and full cloud flying capability, will give just as much pleasure as that new glass hot ship that you can't really afford, while the National Ladder, for all its shortcomings, will give you some measure of your progress, and the opportunity, as Plat once put it, to "poke a rival in the eye".

The one fundamental fact that has stood out loud and clear over the years, first stochastically expressed by the Arm-Chair Pilot in 1963, is that your cross-country speed is directly related to your rate of climb. Whatever you are flying, don't hang around in that grotty thermal; use the best bit then go and find another. Get a copy of George Moffat's **Winning on the Wind**, and study it well. Then just get out there and start using all that performance that you didn't know you'd got.

Soaring Wenlock Edge!

NOT UNTIL LAST SUMMER

ANTHONY EDWARDS

The Arm-Chair Pilot gets to the bottom after 35 years

For thirty-five years it has been one of my boasts that I have never landed at the bottom of that queen of British soaring hills, the Long Mynd, – until yesterday (August 24) that is. Since most people can make the same claim I had better explain.

I first flew at the Mynd in 1956 on one of those memorable Cambridge University GC camps, when the Midland GC used to make over their site for our exclusive use, and we laboured up to Shropshire three times a year with all our equipment, winch, cable retrieve vehicle (yes, I have even driven a tractor from Cambridge to the Mynd), bungy, gliders, instructors, pilots and all. The MGC provided the clubhouse and, best of all, the fairies who lived at the bottom of the hill and were fetched up to cook for us – especially breakfast. Ted Warner was always the principal instructor, and one of his duties was to stand us on the bungy point and indicate which field to use **if it should ever happen.**

In the next few years it nearly **happened** to me several times, and I saw it **happen** to quite a few of my friends. For of course we were bungying whenever we could, and often when we really couldn't, with the almost inevitable consequence. On the first occasion on which I failed to get back to the site I should really have elected to go to the bottom, but events followed one another so quickly that before I had fully appreciated that I was involved in a monumental undershoot, the forgiving Olympia had settled sweetly on to one of the forest rides on the top of the Mynd, to the south-east of the club. Fortunately the spruce trees had only just been planted and the wings passed over them without trouble, but in recent years I have walked along that same forest ride with a sense of amazement that I did my first out-landing in it. I plan to do my last one there too, after the forest is felled.

Just six days later I had my first solo bungy launch (after a single check in the T-21 – we didn't hang about in those days) and attempted five hours from it. Alas, after a couple of hours the wind went round to the south-west and I sank so low on the hill that I inadvertently touched down whilst negotiating a gully at the north end. The Slingsby Prefect, however, trundled cheerfully across the heather and took off again, and because the north end of the Mynd is higher than the flying field I was able to coax her down the hill and back to base. The bottom field was cheated of its prey a second time.

I have landed in a field on the east side of the Mynd of course, but that's quite different. That was in my Slingsby Swallow *Penguin* in 1960 when I discovered that I could hold 300ft on Packetstone Hill (the one which runs eastwards from the north winching point) in a southerly, but I soon got bored, and on trying to move to another hill I had to flee down Minton Batch.

"In this wind direction the Mynd produces the best lift on the side of the Asterton gully . . ."

The following year it nearly **happened** twice in a week. On the first occasion I got stuck on the hill in a fading south-westerly at breakfast time, and all the vultures forsook the bacon and eggs the fairies had cooked to stand on the bungy point and watch me go to the bottom. In this wind direction the Mynd produces the best lift on the side of the Asterton gully, so I was marginally higher on my northbound passes of the bungy point than on the southbound ones. I wanted desperately to get back on top so as to have my breakfast, but on the southbound passes, when I could have slipped in and landed crosswind, the vultures were standing in the way.

On the northbound passes, however, I was about ten feet higher, so on one of them I turned in over their heads on the spur of the moment (they scattered) and put poor Penguin down on the bungy meadow for a downwind landing. Don't try it. She set off across the Mynd more like a startled hare than a flightless bird, scattering the sheep, bounding across the tarmac road, and finally being brought to a halt by the heather on the edge of the east-facing gully. Once again, I should have gone to the bottom, but then I wanted my breakfast.

The second time was because I thought it would be fun to soar the Stiperstones in a westerly, so I let down on to its forbidding slopes on a perfectly good thermal day. Don't try that either. I spent a desperate half-hour trying to soar those wretched rocks, descending to 400ft below the top at one point, with nowhere to land at the bottom. Time after time my attempts to get high enough to dive back over the top and reach the Mynd's bottom field were frustrated by the sink which accompanied each thermal as it passed through.

But eventually I made it, and, racing through the sink behind the Stiperstones, I saw to my great relief that I could reach Wentnor Hill, a stepping-stone to the designated bottom field. I never did soar Wentnor Hill though, because a thermal picked me up and deposited me back on the top of the Mynd. Ted Warner said that he had never before seen a pilot actually shaking on getting out of the cockpit.

The years went by, and the next aircraft that might have taken me to the bottom was my Olympia 463, which suffered a cable break at 200ft on the southerly run. It may not take the Midland GC long to mend a cable, but at Cambridge we order things differently, and I knew that if I landed ahead it would be an age before I got another launch. So I steered for the lip of Asterton gully and just made it over the edge, hoping for a thermal.

I had once watched in amazement as John Pringle (my predecessor as president of the Cambridge club) wound a Skylark 2 out of that

The Arm-Chair Pilot heading for a field landing in the valley below the Long Mynd. Both photos: Nick Heriz.

gully. I must have been standing well back from the hill at the time, because the first thing I saw was a Skylark wingtip emerge from the gully, like a shark's fin, and then each time it came round another foot or two was visible, until finally a grinning John Pringle appeared, followed by the other wing. He thermalled up and away. Well, luck was with me, too. I turned right as I cleared the edge, flew north under the bungy point, turned back at what is now the hang glider field, and tucked myself into the Asterton gully at -100ft. Up I went; but then an Olympia 463 is not a Skylark 2, so Pringle takes the prize. But once again the bottom field was cheated.

So in all these years the vultures have never seen me go to the bottom. Until yesterday. How did it **happen**? Well, I did it on purpose. (He would say that, wouldn't he?) I had had a good hour's hill soaring amongst the hang gliders in a light westerly in the morning, and very much wanted another stint in the afternoon, but the wind was dying. I reasoned that the only way to get some more hill soaring was to be prepared to go to the bottom, so I went to the bungy point and refreshed my memory as to the field Ted Warner had pointed out thirty-five years previously. Then I took a winch launch in my Astir and wandered along the hill, slowly descending through 300ft. Since this was below normal circuit height no one came to join me, and as the wind fell further the hang gliders soon gave up as well, to my great delight.

I counted thirty of them squatting in their field like butterflies in a lavender bush. I never thought I should have the queen of hills all to myself again, but there I was, suspended on a wing and a prayer, whispering along at 38kt in silent contemplation of that superb slope, created in the Cambrian period for my delectation and mine alone. My only company was an occasional glider far above, flying its circuit (at one point the pilot was my daughter Ann; a lot can happen in thirty-five years).

Slowly but surely I sank as the precious minutes floated by, and equally surely the vultures began to gather on the edge: hang glider pilots in a cluster in their field, glider pilots chatting on the bungy point, caravan dwellers at the top of Asterton gully. We waved to each other, and I even managed a little beat-up of the hang glider pilots. But the end was nigh. An Astir is not an Olympia 2 or a Prefect or a Swallow or an Olympia 463 and she doesn't really fit in Asterton gully, so I just relied on her better straight-and-level minimum sink until I was down the bungy slope as far as the point at which the Midland club's power supply is no longer buried, and that was the signal to leave the hill and put her straight into the chosen field. There was, of course, no wind, and I was mildly surprised at its size. In the good old wooden days it had seemed quite large.

Whose field was it? As a visitor, I wanted to make sure I did all the right things by the locals. I asked Ann what the form was, and she said I should ask Len, who said I should ask Keith, who said I should ask John, who said I should see farmer Bowen, who said, no, it wasn't his field, I should see farmer Jones, who wasn't in when I called, but his wife Brenda was. I introduced myself as one of the Cambridge pilots of yore. "Ah!" she said, "and I was one of the fairies!"

CONCEPT TO COMPLETION

The story of how runway "27 left" was built at Aboyne Airfield at the end of last summer

The site from 4000ft showing the new runway. Photo: Glen Douglas.

With Deeside GC at Aboyne growing in popularity over the last few years – 4800 launches in 1988/89 and 6380 in 1989/1990 – it was obvious an additional landing area was necessary. Also, that it would be beneficial to separate the landing and take-off traffic.

When the new 25 year lease was signed with our landlord it was finally decided to lay a 540m by 7m tarmacadam runway to the south with taxiways joining the existing runway.

That was the easy part. Next was who could build it without us having to shut down Aboyne and where would the money come from?

We asked the Aberdeen recruiting office if the local Territorial Army unit could help. After many phone calls and letters this eventually led to a visit by Major Mike Vernon of Army Headquarters Scotland who considered the project might be worthwhile for Army training.

An Army engineer estimated we needed 2000 tons of stone and tarmac and with them doing the work it would cost from £20 000 to £25 000 plus. This was acceptable to the club (even though at the time we hadn't any available money having bought spare engines for the tugs) as we were under the impression we were still at the initial stages of the project.

But the Army were working at a faster pace and it came as a surprise when members of the 216 Field Squadron (Airfield Damage Repair) (Volunteer) from RAF Marham in Norfolk arrived.

Their leader, Lt Mike Smith (a professional road builder) explained that their squadron had been given the job (something to do with their CO being a glider pilot and wanting to fly at Aboyne). They would arrive in late August and lay the runway in three weeks using up to 30 men and women. And as they were used to working on or near live runways they saw no need to close down Aboyne.

We found we needed planning permission

This meeting really started us planning, including how we were going to pay for it all. We found we needed planning permission and little problems like how long does it take a 15 ton lorry to make the round trip from the site to the quarry were thrown at us. Also, where do you accommodate 30 TA members and a complete mobile workshop to maintain the vehicles.

We organised mobile toilets and arranged with the local community centre for our visitors to come in nightly to shower and swim. We were responsible for providing the materials and the Army the plant, machinery and manpower.

On Friday, August 13 the first Army lorry

arrived followed by a stream of low loaders hauling everything from powered graders, JCBs, road rollers and a tar laying machine.

The financial side wasn't looking good. The weather hadn't been very clever so launch hence revenue was below our budget and the appeal to the Scottish Sports Council for a grant under their new "club incentive" scheme hadn't been considered.

On Sunday, August 25 the first sod of earth was cut and on Monday the earthworks started in earnest. This was also the day when Mike Smith awoke to find the cows had been scratching themselves all night against his level posts and all 116 needed resetting.

The good news that Monday was the Sports Council would pay 50% of the runway costs. From then on the sun shone and the work progressed at a furious pace with 12 to 13hrs being the normal working day. On September 6 the runway was ready and our CFI John Dransfield, with Mike Smith, was launched in the Puchacz from our existing strip and after soaring locally landed on the new runway. They were presented with a plaque to commemorate the event by Peter Coward, chairman.

The work had been completed in 11 days and at the same time 216 Field Squadron had built footbridges on the Royal estate at Balmoral and completed two other complex tasks in central Scotland.

If other gliding clubs are planning major projects, yes consider the Army and involve them at the earliest stage possible. At the worst they can only say no.

But don't contact any building or construction company for costings or to discuss the work as this may bar you from getting the Army involved. Also be prepared to devote a vast amount of time in planning and sourcing materials.

Finally to Major Andrew Turner, the Nympsfield glider pilot who got the project for his Squadron, a big thank you to you and your team from us at Aboyne and you are all welcome back at any time.

INTER-CLUB LEAGUE FINAL

The London GC were our hosts for the 1991 final from August 24-26. There were three scoring days in all three Classes and an exciting contest decided on the last day – many thanks to all at Dunstable for a most enjoyable weekend. Our thanks also to T. L. Clowes (Insurance Brokers) who once again kindly covered expenses and prizes.

The fun was shared by six visiting clubs: Nympsfield (last year's winners) from the Rockpolishers, Lasham from the South Eastern League, Cambridge University from East Anglia, Oxford from the Midland League, Swindon from the South Western and Saltby from the Eastern. Sadly neither the Yorkshire nor Northern Leagues joined us this year.

Triangles were attempted in all three Classes

On the Saturday the forecasters predicted gloom despite the sunny start to the day – and they weren't far out. Triangles were attempted in all three Classes: 107km *via* Woburn Abbey and Oxford Headington for the Novices, 150km Biggleswade and Oxford for the Intermediates, with 237km for the Pundits *via* Oakington and Chipping Norton.

Two Novices flew scoring distances: Gary Keall of Saltby (DG-300) won with 35.4km and Tim Browning of Lasham (Astir) flew 32.7km into 2nd place.

Five Intermediates scored. Bruce Nicholson of Lasham (Discus) won at 71.6km, but less than 0.5km and only 1pt behind was Ray Lemin of Nympsfield (Discus) with George Brown of Saltby (LS-7) 3rd at 51.2km.

All six Pundits flew more than 100km. Graham Barrett of Oxford (Libelle) was 3rd at 101.3km, 2nd place went to Phil Jeffery of Cambridge University (LS-7) with 131.6km. The day's winner, Chris Garton of Lasham (LS-6) at 142.4km, said that detour over considerable extra distance had been necessary.

Lasham started Day 2 in a comfortable, though not impregnable lead. The improved weather permitted larger tasks: 146km *via* Chieveley (Nr Newbury) and Didcot for Novices; 218km Pewsey and Swindon for Intermediates; 330km Pewsey, Lasham and Blakehill Farm for Pundits.

Four Novices completed their task, including Chris Reynolds of Oxford in a Skylark 4 (42.1km/h). Third was Colin Smithers of Cambridge University (Pegasus) at 45.9; 2nd Rob Hanks of Nympsfield (Std Cirrus) at 46.5km/h with the winner, Tim Browning of Lasham (Astir) at 52.1km/h, giving Lasham a strong overall lead in the Novice Class after two days.

One Intermediate landed out at 201km but all others finished at speeds over 50km/h, with Tom Lamb of Oxford (Mini Nimbus) 3rd at 63.2km/h. The very close contest for 1st and 2nd places on Day 1 was repeated. Bruce Nicholson won again, at 75.2km/h – with Ray Lemin 2nd again at 74.6km/h.

Five Pundits finished, with Ted Lysakowski of Lasham (Ventus) 3rd at 78.5 and Russell Cheetham of Saltby (DG-600) 2nd at 80.8km/h. Day winner was Andy Davis of Nympsfield (LS-4) at 88.8km/h.

Andy had brought Nympsfield up into 2nd place overall behind Lasham in the Pundit Class after two days. This pattern was repeated making an exciting start to the final day – Lasham in the lead in all three Classes, with Nympsfield hard on their heels, 2nd in all Classes.

Day 3's weather permitted still larger tasks, dismissing all thought of Bank Holiday traffic. Novices flew 160km *via* Didcot and Towcester; Intermediates 303km Andover and Evesham and the Pundits flew 382km *via* Andover, Stourport and Little Rissington.

There were five Novice finishers, with John Birch (Pegasus) 3rd at 52.8km/h putting Cambridge University into overall 3rd place in the Novice Class. Rob Hanks (Std Cirrus) 2nd at 62.9km/h kept Nympsfield in overall 2nd place. Congratulations to Tim Browning whose 74.2km/h won the day, retaining the overall lead for Lasham.

Stuart Thackery (Open Cirrus) was 3rd in the Intermediates at 57.8km/h, and put Swindon into overall 3rd place for the Intermediate Class. For yet a third day the first two places were closely fought between the same two pilots, with Bruce Nicholson of Lasham 2nd at 76.3km/h. The day winner was Ray Lemin at 84.1km/h – sufficient margin to take the overall lead for Nympsfield in the Intermediate Class. Considering Novice and Intermediate final scores, Lasham and Nympsfield were neck and neck and all depended on the Pundits.

Four pilots completed the 382km Pundit task. In 1st place was Mike Jordy of Saltby (ASW-20L) at 80.6km/h, who reported awkward blue conditions at the western end of the task. His win pulled Saltby up into 2nd place overall in the Pundit Class. Second was Peter Baker (ASW-20) of Cambridge University at 77km/h. Steve Parker (LS-4) came 3rd at 71.7, enough to give Nympsfield the overall lead in the Pundit Class.

Congratulations Nympsfield – 1st place in the Pundit and Intermediate Classes and 2nd place in the Novices made them overall winners of the Douglas trophy for the 2nd year running. Lasham were 2nd overall with Oxford 3rd.

Once again many thanks to all at Dunstable who worked so hard to give us such a successful contest, particularly Ed Downham, who master-minded proceedings, and Derek Sear, David Starer and Clive Bird.

Any other business. Some concern has been expressed about the new Novice Class definition agreed before the 1991 season – there is no longer any hours limit on a Novice pilot. The most frequent objection is that early solo pilots beginning to fly cross-country, the very ones the League was set up to encourage, become de-motivated. They are either not picked for their own team, or are asked to fly against "experienced" pilots on opposing teams.

Team captains should try to fly many different pilots

The reasoning behind the new rule was believed to be sound, based on the following main points.

- Aspiring new Novices should be encouraged to fly tasks to earn their place in the team – and to fly the contests *hors concours*.
- They should feel challenged by the opportunity to fly against more experienced Novice pilots, including their instructors, and get a much greater boost when they win.
- Those Novices with over 150 solo hours, who would have become Intermediates under previous rules, include many whose progress has been slow and who would never be selected as Intermediate. The rule was changed primarily to encourage these people. The Novice Class provides a competitive bridge between Silver and Gold distance.
- Team captains should broaden team involvement by trying to fly many different pilots, not necessarily their strongest contenders every time.
- More pilots become eligible, avoiding the urge to send Novices off too early – many clubs needed this and prangery has reduced.
- Any genuinely good Novice is likely to qualify for the Intermediate Class before long.
- Any club finding this not in their favour should take the opportunity when they host a weekend to set 300km for the Novices in order to promote the opposition into the Intermediate Class!

No rule will satisfy all of the people all of the time – hence rule 19 permits changes if agreed between all clubs in any League.

The Coventry GC have proposed an Eastern League discussion one Saturday in late February or March – and would welcome members of any other League to join the debate. The proposed venue is Husbands Bosworth and the League will be given the date as soon as possible. Anyone who'd like further information is welcome to contact Mike Jefferyes, Tanglewood, Fingrith Hall Rd, Blackmore, Nr Ingatestone, Essex CM4 0RU. Tel 0277 823066.

ONE DAY IN THE MOUNTAINS

Nick recalls flying his LS-7 on a task day in the Allgau Mountain Competition from Kempten, Bavaria, a few years ago

There had been something definitely dodgy about the sky all morning. Sure, it was blue, but there was a steely brilliance to it, and there appeared to be a whitish hue appearing from the south-west.

Nevertheless the first signs of cu appeared over the mountains around lunch and we launched shortly after. Because it was totally stable over the plain, tows were to 3000ft with starts timed from release.

We climbed through a visible inversion at about 2500ft and I was waved off about four miles from the foothills. I slid gently over to the nearest slopes, reaching them at about inversion height. I turned right along the hillside, mostly grass but with the occasional conifer. In such conditions at Kempten you have to get established quickly, or you get too low to fly back to the club for a relite.

The sunny slopes offered nothing, so I turned back to the north. Descending gently, I hugged the hillside, pulling out only to avoid the occasional walker. Coming round to the north face I at last found the weakest of lift and with no alternative stopped to work it. Two hundred yards away and slightly above me, a woodman was tending a fire. The smoke was trailing out horizontally.

"The mechanics are best explained by considering an omelette in a pan"

Valley inversions in the Alps can be tiresome. There may be excellent conditions above, but below convection may be weak or non-existent. The secret is knowing how to get through it. The mechanics might be best explained by considering an omelette in a pan. As it heats up, you can see the gas bubbling up under the omelette, but the only way it escapes is round the edge. So it is in the mountains, and a perfect example is the valley at Reutte just over the Austrian border from Füssen.

If you get below the inversion you fly over to the Schlossberg, a small hill in the middle of the valley. This nearly always works, however feebly, so you climb up to inversion level, then glide over to the slopes of the Tauernberg in the hope of coinciding with a bubble escaping up the slopes. It sometimes takes two or three attempts, but you know when you've managed it when the slope lift persists weakly through the inversion and then accelerates up as you come into the crystal clear air above.

Anyway, back to that slope, where it took another 15min before I realised that something had changed, but couldn't immediately put my finger on it. Then I saw it – the smoke was rising vertically!

I'd been climbing almost imperceptibly – you can check it branch by branch on each sweep – and had just enough height to fly over to it. Too low to circle I hung a wing over the fire as I swept past. The lift was strong enough to enable a repeat performance from the other direction. Three beats later I'd enough height to start circling directly above it. Six knots on the averager soon had the woodman shrinking visibly below. At 9000ft condensation level came up simultaneously. Maybe not such a bad start after all.

The first TP was the village centre at Kühtai, high up atop a pass on a parallel valley to the south of the Inn valley some 70km away. I set off at a fair rate of knots, not unduly worried that I didn't seem to be meeting any thermals because the air felt quite bumpy.

This leg entails crossing the ridge of the Lechtal Alps, with heights up to about 8500ft, to reach the Inn valley, although if necessary you can get through the Fern pass at a lower height. The aim is to reach the Tschirgant – the Giant – a vast mountain in the middle of the Inn valley, just above ridge height, because there is **always** a booming thermal or thermals coming off the south or west faces.

I reached it as programmed and it didn't work – nor had the north face of the Inn valley as I crossed it either, albeit bathed in the diminishing sunshine. There was some very ragged cu way above, but whatever I tried I could only find broken lift to take me up to about 500ft above the summit. I had to have the height, however, to get to the south side of the valley and round the back and up to the TP.

Eventually I set off in disgust just as a Janus came in below me. On the south side the high wooded slopes again promised, but offered nothing. To the east I could see the village about four miles and probably 500ft above me. Had I understood the weather, which I couldn't, I would under normal circumstances have flown up the valley along the side of the road, and expected the wind on my tail to carry me upon ridge lift to the village and over the pass.

There was a certain attraction in the thought of creaming up the main drag and photographing the menu on the wall of the inevitable Hotel Post as I went over the top, but my first rule in the Alps is – if you don't understand it – don't risk it. So I headed back the way I came, resolved to fly along the south face of the Inn valley and if the worst came to the worst I would just have to land below. Who should I meet flying out round the corner but the Janus again, going the other way.

Turning east I headed off into the shadow along the vertical rock wall of the south face. Two miles later I hit gentle but persistent lift, the first proper thermal since climbing away from the start some 80km before. Somewhat surprised I climbed up to the ridge, and there lo and behold was the village on the other side with the Janus circling right above it. I flew over, took the photo, and joined the thermal, now way below him. Not particularly strong, it was nevertheless a classic mountain thermal rising straight off the saddle at the top of the pass.

The sun had now gone and it was darkening rapidly in the west. Taking my cue from the penultimate thermal, however, I continued along the south face of the valley and now the lift was predictable. The steeper and darker the face, the better the thermal. I pondered the likely trigger – wind shadow, suction, wave action, possibly even the colder air from the fast approaching front creating a line of instability as it flowed over the lip above the warmer air in the valley below.

And this introduces my second rule in the Alps. Stick strictly to the rules – sun-facing slopes, ridges, saddles, bowls etc, etc etc. When they stop working, do exactly the opposite. This policy rarely fails, but sometimes you lose time not recognising quickly enough when to switch.

"Turning high I looked down to see the Janus again way down below on the ridge . . ."

I pressed on quickly over the Brenner valley with the Europa bridge way down to the right, and passing to the left of the mast on top of the Patscherkofel towards the second TP. This was the little chapel at the summit of the 7690ft Kellerjoch, at the entrance to the Ziller valley. Turning high I looked down to see the Janus again way down below on the ridge – he'd obviously misread the conditions as I had previously.

Approaching the Patscherkofel again, taking care to fly along exactly the same energy line, I radioed Innsbruck Tower for clearance to cross over the Airport to the north side of the valley. A polite affirmative, and I set off for the Nordkette, the northern range above Innsbruck.

It was black in front now and the gloom obviously presaged snow. At the west end of the range I had to take a decision. There are in fact three ways back from here. First, you can follow the north face of the Inn valley to the Fern Pass and turn right. All things being equal, if you are high enough to get through the pass, you can final-glide back.

Above: Rock climbing. Strong lift and turbulence in this zone must be countered with quick reactions and adequate reserves of speed.

Secondly, you can take the direct route along the valley from Seefeld, passing the Zugspitze on your right, and over Ehrwald to Reutte. Thirdly, if it looks grim in front, and bearing in mind that it's a long valley and there are not many landing places, you can go round the back of the Zugspitze, over Garmisch Partenkirchen and out along the northern slopes of the Alps and back *via* Füssen. It is quite a detour, but it can get you out of trouble if things get really nasty along the other two routes.

The problem is that the particular topography between Seefeld and Reutte, a long, narrow valley opening into a large bowl in the centre, dominated on its eastern side by the Zugspitze massif, can exacerbate dramatically the effects of approaching fronts, damming up the clouds and turning day into night in the valley below. Even in fine weather, thunderstorms forming off the west wall of the Zugspitze, or off the Blattberg further along the valley to the west, magnified by the selfsame triggers, can be fearsome, not only in the speed with which they can develop, but in the secondary downdraught phase when the centre of the storm collapses into the valley, and the cold air is forced at high velocity out of the three exits – at Reutte, Seefeld and Garmisch.

Nick on oxygen and in shirt sleeves while the external air temperature is –18°C.

Below: The startline at Füssen GC. The first ridge provides the medium level thermals to transition to the mountains. All photos by Nick.

So I headed north as the snow started falling round me, reducing visibility to a 60° cone below. I'd taken a compass bearing on the way out through the mountains, so I wasn't worried about flying into anything – nevertheless I needed another climb at least to get to Füssen comfortably. There was no obvious source of lift, so I studied Garmisch intently as it approached below.

A possible answer immediately became evident: the ski-lift from the side of the town up to the top of the Esterberg was cut through the trees and faced directly into wind. I would have bet my bottom dollar that any warm air in the town half-minded to go anywhere would be channelled straight up it. I slid over to it, and sure enough just above the cables was 1½kt.

I took it up gently in the thickening snow, checking again the exact compass course out of the mountains. When I reached the absolute limit of visibility I set off in near darkness on what appeared to be a final glide to Füssen. There was just a chance that the ridge to the south of town would work and give that last climb to get over the hill to Kempten. It was also late afternoon by now, and the fairground at the far end would be in full swing, which might just help.

I reached the town at 500ft – nothing. Over to the fairground – a tremor. I circled gently over the beer tent. The vario was non-committal. I exchanged pleasantries with the riders atop the ferris wheel. Then a warm smell of beer and roast pork – J had been wittering on about the sucking pig there all week – but the lift, like all alcohol-induced blandishments, failed to live up to its promise and I set off again. The ridge beyond beckoned seductively, but somehow that pork had blunted my senses. Two minutes later, resolve expunged, I was on the ground at Füssen. I radioed through to Kempten, tied down the glider, and leaving a note on the parachute – *Pilot im Bierzelt* – legged it to the fair. As I entered the tent I looked back to see the Janus on finals. It was going to be another of those Bavarian evenings.

The Füssen Mountain Comp is from June 13-20 following a two week mountain flying camp. Any inquiries to me, tel 0509 890469.

WINCHING – MYTHS, MYTHOLOGY AND FACTS

Travelling around Bill Scull, BGA director of operations, hears views about winching which concern him. Sometimes these opinions fly in the face of the facts and may be potentially serious

For years gliding has been a DIY activity, not least the building of winches, and with some very good results and not a few disasters, both in performance and cost effectiveness. One factor which made poor performance winches acceptable was large airfields but with some sites the length was limited and, of course, gliders got heavier and faster. The ultimate irony is a line of gliders worth, perhaps, £1 million waiting to be launched by a wholly inadequate winch (or towcar) assembled from scrap iron worth a few hundred pounds.

What has changed?

The change is the acquisition of high performance winches, Supacat, Tost or van Gelder, in increasing numbers. The benefits are a higher launch and, the evidence suggests, less risk of launch failure and cable break accidents. Such winches cost upwards of £30 000 and, given sufficient utilisation, should soon pay for themselves.

The other significant change is the use of the appropriate strength of weak link. The historical aspect is significant here. British gliders were designed to use a weak link strength of 1000lb. Gliders designed in other countries had, for the most part, a much higher weak link strength. However, imported gliders were not replacarded and so had limiting speeds appropriate to the stronger weak link, a figure which was often lower than the equivalent speed for a British glider.

These factors seem to have caused some confusion as to what is allowable and what isn't in terms of flight limitations.

The Myths

I've heard it said that **"the winch launch limiting speed does not matter"**. Then why is the glider placarded with a limiting speed? Another view recently expressed is that "It's better to use a weak link which is stronger than the recommended one, rather than risk the link breaking (and having to deal with the consequences)". Combine these two opinions and the question is then why have a limiting speed or weak link at all?

A Basic Understanding

There are a number of fundamental points regarding the loads on a glider in the winch launch. The first is that the pilot has little or no feel for the loads on the glider. A simple sum illustrates this:

A K-13 has a maximum AUW of 1060lb in the semi-aerobatic category and a weak link strength not exceeding 2200lb (Tost black No. 1). Given the maximum pull on the cable and assuming a C of G hook coincident with the centre of pressure then the wing lift cannot exceed 2200lb without breaking the cable. However, there is an allowance in the design calculation of 1.2, that is 1.2 x 2200 = 2640lb. In terms of free flight wing bending loads this is equivalent to 2.45*g* but without the benefit of the inertia relief from the accelerated wing weight acting downwards. Since wing weight is over 50% of the empty weight this inertia relief is significant; the winch launch wing bending loads are equivalent to about 3*g* in a free flight manoeuvre.

The factor of 1.2 is an allowance for the gust load case which bends the wings before it breaks the weak link. So too strong a weak link removes this element of protection. If you ignore the speed limit then who knows what might happen. To suggest ignoring either is cavalier and it is downright irresponsible to suggest that others might do it.

A factor of which not too many pilots are aware is that the glider has a design manoeuvring speed. The significance is that below this speed a glider will withstand the forces deriving from full control deflections. At the never-exceed speed the allowable control movements are reduced to one third. In the winch launch it is not inconceivable that the glider will have full up elevator and applying full rudder if signalling too fast could prove to be critical for the rear fuselage.

Operational Considerations

The most fundamental point is that as many gliders become airborne they will require full forward stick to control the nose-up rotation. Without this control input they will rotate into the climb too quickly. If the cable breaks in this first critical phase, recovery may not be possible. Other factors which may make matters worse are any delay in recovering and the glider being flown at, or near, the aft C of G limit.

If, for any reason, the pilot fails to make this vital control movement and worse, has the control column neutral or back, the consequences can be disastrous. The glider may spin on the launch. Such accidents are usually fatal and the distraction that can give rise to the circumstance are:

1. Problems with the ground run, the wing dropping or loss of directional control due to a crosswind.
2. A light glider and a snatched launch with a powerful winch.
3. Pilot reversion to control inputs may be appropriate to other gliders on which he has more experience.

The last point needs explaining. Broadly, there are two types of glider – those with the C of G forward of the mainwheel and the others with it aft. The first type with pilot(s) on board sits nose-down on its skid. In this configuration a pilot may start the ground run with the stick held back; this might be appropriate for aerotow or even autotow *but not for winch!* This does not need to have any effect on the length of the ground run; the pilot still aims to get the glider balanced on its mainwheel as soon as possible. After all the pilot can only lift the nose once he has elevator authority.

The stick position becomes even more critical for gliders with the C of G aft of the mainwheel. The likelihood is that a neutral stick position is appropriate then, as the cable tightens, followed by the appropriate forward movement as the glider becomes airborne. Strictly we shouldn't be talking about stick positions at all; the requirement is simply to balance the glider on the wheel although tail-wheel types will take-off from the two-point attitude.

However, the tendency is to be drawn into discussing stick positions rather than flying the glider and controlling the attitude. Using stick positions to give a student guidance is "teaching by numbers" rather than encouraging them to think. After all, the stick position is modified by wind strength, wind gradient and cockpit load isn't it?

The reversion mentioned earlier is using a more familiar technique in a glider for which it is not appropriate. Stress can also cause this tendency – type conversions, difficult conditions, lack of recent practice can all be stressful.

The subtleties of teaching this exercise may be overlooked in basic instruction and potential problems, compounded by a lack of understanding (= ignorance), only become evident in accident analysis. For example:

- As the glider, a Club Libelle, was being winch launched the wingtip dragged along the ground for a few feet before take-off. (See Bill's article in the last issue, p302.) When the glider became airborne it rotated into a very steep climb and spun from about 80ft while still attached to the cable; it hit the ground wings level and slightly beyond the vertical. The pilot was killed.

The ultimate protection against launch accidents is *to release the cable if anything untoward occurs.* This applies to any fault – swing on take- off, the wing going down or dropping, snatched launch or cable over-run. Incidentally, have you considered that using full aileron when the wing starts to go down may put the

wing down because the aileron causes the down-going wing to stall completely. This applies particularly in the modern (GRP) glider and, once again, the situation may be compounded by reversion.

In the interest of safety, instructors should teach these facts and all pilots should know them. It might just prevent someone else from becoming a statistic!

* * *

Technical Guidance on Winch Launch Limitations/Technique

1. The loads on a glider during winch/auto launch are rather less easy to appreciate than in the various free flight cases. Perhaps the easiest aspect to understand is that the wing must develop extra lift to balance the (down) load of the cable tension. This extra lift dramatically increases the bending loads, notably at the wing root, since the cable tension is a central point load, and not distributed evenly like wing lift or wing weight.

The amount of wing load that can be applied depends on the power of the elevator and the extent to which the pilot pulls cable tension. The wing load is limited by stall boundary (low speed) and the strength of the weak link at higher speeds (determined by the design of the glider). Wing loads equivalent to 3*g* in free flight can easily be achieved. It warrants mention that, unlike the free flight manoeuvre cases the pilot's body receives no such *g* sensations commensurate with this extra loading since no significant body accelerations are involved.

2. The steady climb situation just described can be further aggravated if an up-gust is encountered. Provided that the correct weak link is used it should not be possible for a gust to fail the wing since it will stall or the weak link will break first. However, it must be recognised that the glider can be stalled by a much lesser gust than in free flight because the additional launch loads puts the glider much nearer the stall boundary. This, of course, leaves the pilot with a potentially critical handling problem, particularly close to the ground – the cause of some recent fatal accidents.

3. The winch launch limit speed must be observed for several structural reasons beyond the one described above. While the pilot maintains full climb demand the tailplane and rear fuselage will also be operating close to their design loads. This load is accrued from the cable tension, depending on the hook position, the elevator demand and the anticipated gust. The down load on the tail in the design condition can be of the order of half the weight of the glider.

The launch limit is usually only marginally less than the free flight rough air, or manoeuvre speed. At this speed the loads due to sharp control inputs also approach the design values. The compounding of all these design values means that attempts to manoeuvre, such as making a too fast signal, will place the glider closer to safe limits.

4. If your glider is approaching winch launch limit speed and appears likely to exceed it, the available safeguard action is to reduce climb demand and "unload" the airframe. This action is of course only a temporary measure since the glider will continue to accelerate. However, the action of "unloading" will increase the gust, stall and weak link margins while making the too fast signal. Too fast signals should be executed with due care if the limit speed appears likely to be exceeded. If it is judged that there is insufficient time to signal or that the speed is likely to exceed the limit by a significant margin before remedial action is completed, then releasing the launch cable must be considered as a prepared option.

5. With modern powerful winches it is not acceptable to maintain full climb at speeds approaching the launch limit figure in the expectation of "pulling down" the winch output. Torque converter and governed winches are specifically designed to maintain near constant power regardless of demand. So, in continuing a full launch, *you* the pilot are relying on the observation and skill of the winch operator to safeguard *your* glider. Should the driver, with his limited information, not perceive the situation then the only thing standing between the glider and structural failure is the weak link. Thus it is vital the correct rating of weak link is always used.

Howard Torode, *chairman, BGA Technical Committee*

AIR LINES

Like some exotic bird of passage the aerobatic pilot comes back to the airfield in the spring. Then throughout the good part of the year he stops here to refuel as he hustles his thirsty, sharp-nosed Pitts from one air display to the next. We feel flattered by his brief visits as you feel flattered when some wild creature makes its home in your garden, or a strange cat selects your lap to sleep on.

On the day that the midsummer storm swept across the airfield we all helped him to push his little aeroplane into the safety of the hangar. There was no real necessity for our help. The biplane was so light that the pilot could have managed it alone, but we wanted the excuse to touch it.

The Pitts stood in the gloomy hangar, its scarlet and cream paintwork beaded with rain, its nose raised primly, slumming it amongst our shabby Chipmunks. It was a machine that had the power to make even a Ferrari seem undistinguished.

"Like his aeroplane the pilot was small, neat and tough"

We asked the usual questions about the aircraft, a little shyly because it, and what the aerobatic pilot could do with the performance, were far outside our experience. He answered seriously and politely, though the same questions must have been put to him a thousand times before. Like his aeroplane the pilot was small, neat and tough. You had to look very hard to see on him the marks of those tensions that forced him into regions where the rest of us dare not go.

We stood listening to the sound the rain made on the corrugated roof of the hangar and watching the dark edge of the horizon cracking slowly apart to reveal the pale oyster-blue above. From a breast-pocket of his overalls the pilot took out a card marked with the hieroglyphs of a series of aerobatic manoeuvres. He paced out the sequence slowly along the horizontal line of the open hangar door, occasionally checking the card, frowning, muttering to himself, making tight, controlled movements of his hands. It made me remember being backstage while a dancer rehearsed the steps of a new routine. We were all there in the hangar with the pilot, but he was a long way from us and he was already alone.

TOM BRADBURY

SKYWATCH – A Beginner's Some Cloud

Part 1

If you have time to spare, waiting for a launch or walking over open fields, try watching the development of individual clouds. Pilots who regularly make long flights and compete successfully are usually very good at reading the sky. Beginners may not notice all the indications of lift or sink. Once airborne it is much harder to see what all the clouds are doing so it is worth watching them from the ground to learn their ways.

What thermals may look like before cloud forms

Experiments in a glass sided water tank made the thermal bubble a popular model. Liquid thermals do look very like inverted cumulus clouds, but the model cloud is initiated by inverting a cupful of denser liquid and thus starts with a hemispherical shape.

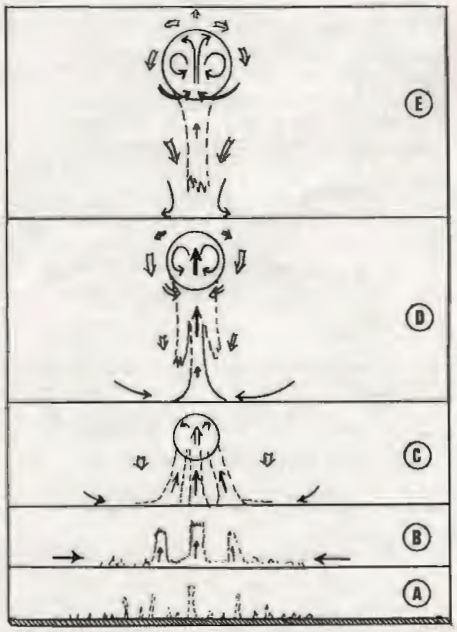


Fig 1

Photo 1. Cylinder of smoke from active stubble fire.

Photo 2. Inverted cone of smoke as

Below: Photo 4. Low aspect ratio cloud (fairly long lasting).

Most real thermals start from a fairly flat surface. The warm air can be thought of as forming a wide but very shallow disc; the height may not be more than about 20 metres. If one specifies an excess of temperature of 2°C this disc should accelerate upwards at about 0.067m/sec². This value is derived from the density difference multiplied by gravity divided by the absolute temperature. (9.81 x 2/293 assuming a surface temp of 20°C.) At first glance this seems unimpressive acceleration but if there was no mixing or drag to slow it down it would reach a speed of 40m/sec (nearly 80kt) after ten minutes.

Fig 1 shows some of the stages in transforming a flat disc into a tall thermal. The disc cannot lift off vertically like a flying saucer; the form drag would be enormous. What seems to happen is that little tendrils of air start rising like steam from a hot bath (A). One can sometimes see these misty thermals after a forest has been drenched by rain. When the sun comes out again the forest sometimes sends off tendrils of mistiness which rise very slowly. They show no sign of changing into bubbles before the mist evapo-

s stubble fire burns out.

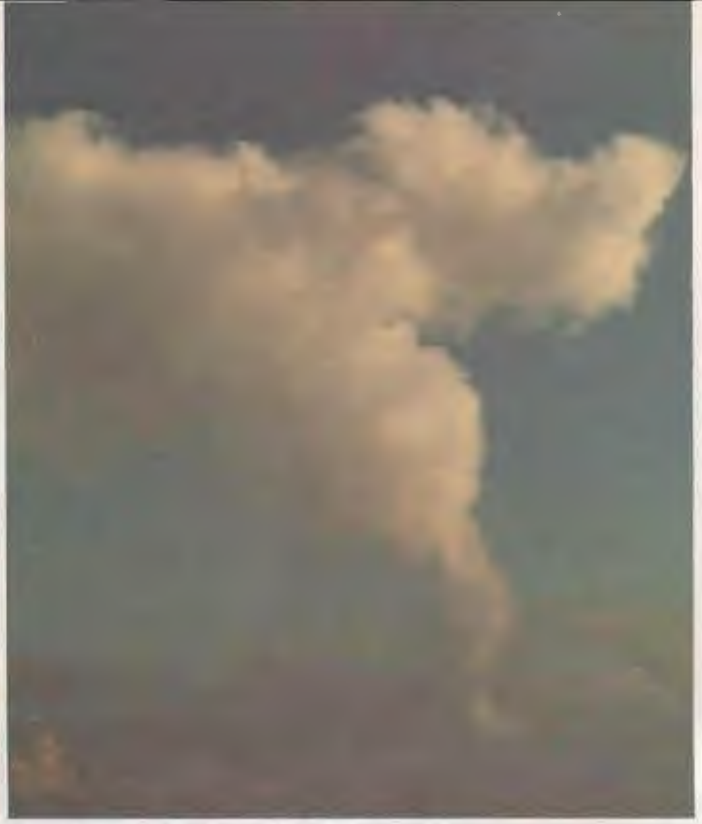


Photo 3. Conical tail from a dud cloud.

's Guide to ls

rates. Presumably the process is much too gentle. Another example is "arctic smoke"; wisps of mist or fog rising off warm water during a very cold spell.

Until these tiny wisps become more organised they cannot rise far. To form a thermal the tendrils must amalgamate into small plumes which in turn join up to form wider columns (B).

Plumes which combine to make a good sized cylinder usually go on to form a dome shaped top (C).

As the air is gathered up into the thermal the original disc shrinks and there is an indraft of surface air. This is sometimes strong enough to produce a change of wind on the ground. When it is almost calm windsocks or smoke from bonfires may show this inflow as the thermal takes off.

The dome eventually forms a thermal bubble (D) linked to the dwindling reservoir of hot air on the ground. Finally the link is broken and one is left with a sort of ice-cream cone shape. The air in this cone is eventually absorbed into the bubble.

Columns cones or bubbles?

Two pictures of stubble fire smoke suggest how thermals may behave. Photo 1 shows the thermal at full strength when there is a continuous supply of heat. The smoke forms a cylinder with almost parallel sides reaching from ground level to the bubble of cloud at nearly 5000ft. Photo 2 shows what happened when the fire went out. The cylinder changed into an inverted cone. Higher up most of the smoke spread out into a roughly spherical shape. The stubble fire is an exaggerated heat source but the smoke gives a good indication of how less violent thermals behave.

Thermal bubbles do not seem to form in all cases. They need enough temperature difference to accelerate the thermal to sufficient speed with enough mass to form a good sized bubble. Some plumes do not grow into thermal bubbles at all, or not until they pass the condensation level and get a boost from the cloud. If the plume has little energy left when it reaches the condensation level it just drifts on to form a ragged puff. Flying through such puffs shows very little turbulence and no sign of a bubble.

Below: Photo 5. High aspect ratio clouds (short lived). Photos and drawings by Tom.

Putting numbers to the imaginary thermal

If we start with a disc 2000m across (about the size of a big airfield) with a depth of 20m the total mass works out to about 76000 tonnes. Ignoring any expansion with height this disc would provide a thermal cylinder 1000m high by 141m wide, or a shape like an ice-cream cone 1000m high with a top radius of 206m, or eventually a sphere radius 246.6m. Fig 2 shows this series of options.

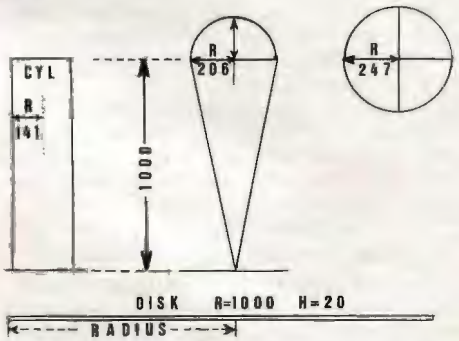


Fig 2

Large and powerful thermals probably do produce a tall cylinder of lift, at least for a time. When the heat source is exhausted the cylinder changes into an inverted cone. Finally the cone is drawn up into the expanding bubble.

When there is only a finite source of heat which soon becomes exhausted the thermal shape probably goes through the stages in Fig 3. This shows a simplified version in four stages, A to D. Each is a cross-section of a circular volume of air, starting with a shallow disc and ending up with a sort of ice-cream cone. The ➡

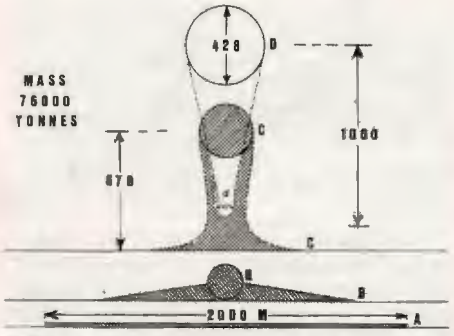


Fig 3

cross-sections are drawn to contain the same mass of air throughout. B shows the region where a bubble might start off with a very flat cone of warm air feeding it. C shows the expanding bubble at the top of a cone with its centre at a height of 670m (about 2200ft). D shows the whole mass now detached from the ground. The reservoir of hot air is exhausted and has been converted into a bubble and cone about 1000m tall. The bubble itself has expanded from 200m in diameter to over 400m in diameter.

Do gliders weigh down a thermal?

If the thermal is as massive as suggested its ascent is not likely to be seriously hindered by a few sailplanes circling inside it. However, when circling in a rather weak thermal one does wonder if it will really support any more sailplanes. I had great sympathy for the 15 Metre pilot circling in a tired thermal when he was pounced on by a gaggle of Open Class monsters. Picking up his microphone he said "Go away! This is only a Standard Class thermal".

Entrainment

The example in Fig 2 is not the full story. Water tank models show that thermals grow in size by being diluted with the environmental fluid. This process is called "entrainment". The tops of big cu consist of a large dome which is made up of hundreds of smaller domes. This region of different sized domes is where the environmental air is folded into the thermal. At first most of the entrainment occurs at the cap but as the bubble grows some of the outside air sinks round the side and is pulled into the bubble from underneath as well.

Entrainment cools the thermal

Entrainment makes the bubble expand and dilutes the warm air, so reducing the difference in temperature. When a thermal rises into a stable layer the temperature contrast is changed. The outside of the thermal is warmed by mixing but the faster rising core continues to cool at the original rate. This produces the unexpected result of the fast rising air in the core becoming cooler than the slower rising, or even sinking, edges of the thermal.

Attempts to detect thermals by measuring temperature differences usually fail except near the bottom. Only in the first few hundred metres is the rising air significantly warmer than its environment. In the middle levels there is little difference in temperature and at the top the best lift is actually in colder air. Fig 4 shows the bubble rising on the left with speeds of 2.5kt strengthening to 6kt between 1500 and 2500ft. On the right is the temperature profile through the thermal. At ground level it is 2°C warmer. By 300ft this is down to 1.5°. In the range from 1500 to 2500ft it goes from fractionally warmer to a tiny bit colder than the environment. Then at the top where it reaches the inversion the lift drops off rapidly, but the temperature profile shows the core to be 1.4° colder than its surroundings. (This is just one of a number of numerical thermals. One can have different figures and in extreme cases the thermal core was 4° colder than the environment before being halted.)

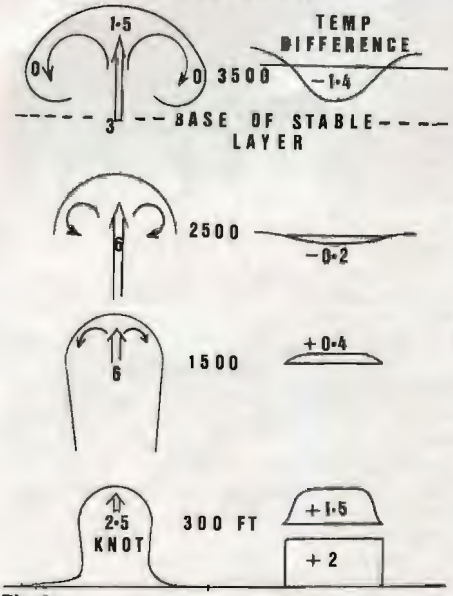


Fig 4

Little bubbles or narrow cylinders are diluted quicker than wide ones

The rate of entrainment depends on the surface area of the bubble but the dilution depends on the internal volume. As the radius of a bubble grows the volume increases faster than the surface area. Fig 5 shows how entrainment can stop

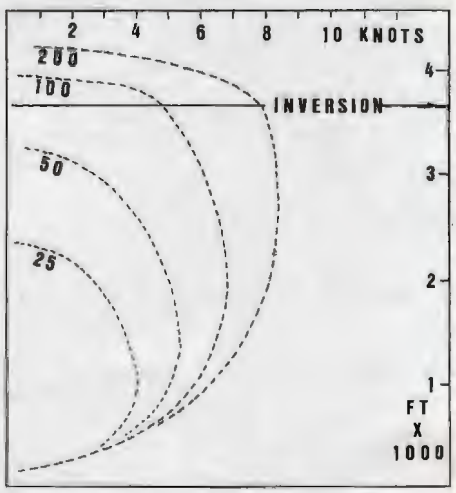


Fig 5

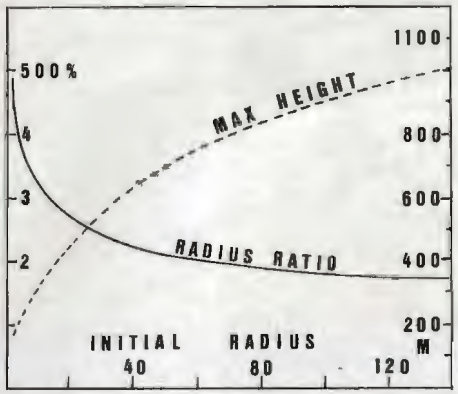


Fig 6

little bubbles from rising far. Initial bubble sizes are marked against the curves. They show that the height reached depends on the initial radius. In this calculation each bubble started with 2°C excess and ascended through an environment which cools off at 8°km (less than a dry adiabat). As a result thermals smaller than 100m initial radius failed to reach the inversion. The larger bubbles rise much further and faster and penetrate the inversion. The curves also show the rate of ascent (marked in knots along the top).

Little bubbles expand more than big ones

Fig 6 shows two curves. The solid one is the ratio of initial to final radius. The pecked line shows how high bubbles might go. The initial radius is shown along the bottom ranging up to 140m. The maximum height reached is marked on the right and the percentage increase in radius on the left. The solid line shows that the smallest bubbles may have a 500% (or more) increase in radius while the larger ones increase by less than 200% even though they have risen further.

Penetration into stable air

When a thermal goes through an inversion and starts to push into stable air the penetration depends on both the temperature difference and the speed of the bubble on entry. Fast moving thermals can go a surprisingly long way before the deceleration caused by the temperature difference overcomes the momentum. This sometimes carries the bubble high enough for a puff of cu to form well above the original base of the inversion.

First thermals are usually feeble

The effect of entrainment probably explains why the first thermals of the day are apt to be disappointing. These thermals are usually short lived. It seems as if they lift off before they have a big enough reservoir of heat to draw on. They form small bubbles which are quickly diluted and seldom reach the top of the unstable layer.

The appearance of the first clouds

Once the rising thermal has passed the condensation level extra heat is put into it by the release of latent heat of condensation as cloud forms. Fig 7 shows how this may change the rate

of ascent. The curve marked "Blue" represents air too dry for clouds. The upper curve marked "Cloudy" branches off the blue curve when the thermal passes the level marked "Cloudbase". The extra heat released by condensation makes the thermal warmer and more buoyant so it accelerates. Being warmer it rises further into the inversion layer. Because it is moving faster it has more momentum too so (in the conditions selected for this example) it ends up about a thousand feet higher. On days of stratocumulus spread out one may climb in a growing cu and come out into the blue well above the 8/8 sheet which marks the inversion. Cu which penetrate like this seldom survive long. The air aloft is often so dry that evaporation soon cools and destroys them.

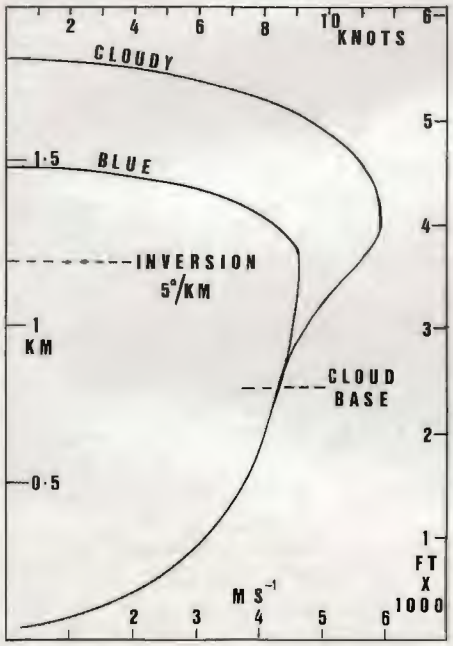


Fig 7

Starting puffs

Little bubbles which barely manage to reach the condensation level produce short lived shreds of cloud. These do not seem to have any dome or bubble shape when they appear. If a bubble had existed lower down it has been too diffused by entrainment to retain its shape and circulation. Do not trust such clouds as thermal indicators. By the time they make these puffs almost all their energy has gone and there is no cone of lift beneath. One can tack back and forth trying every cloud in sight and never finding any which work. It is possible to stay up, however, because one bumps into blue thermals in between. Early in the day thermals may be small but they are often fairly close together.

Thermals when there is a light wind

A light breeze often stimulates the release of thermals. In really still conditions quite large reservoirs of warm air can build up before something sets off a disturbance large enough to produce a good thermal. If there is a light breeze

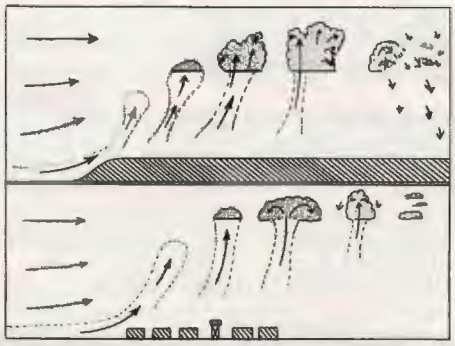


Fig 8

the warm air is pushed gently across the ground until it reaches an obstruction. Fig 8 illustrates two possibilities. The lower section shows the shallow disc of hot air bumping into a line of hangars and being triggered into releasing a series of plumes which grow into bubbles higher up. As time goes on the entire reservoir is used up and the thermal dies out. The repetition rate depends on how fast the airfield heats up again. It may be a long time when the sun is low.

The upper section shows the sloping edge of high ground acting as the trigger. This is often better than a low level obstruction. The slope lift gives the embryo thermal a boost to start it rising and the high ground (being dry) heats up quicker and provides a good reservoir for the thermal to feed on as it drifts along.

An initial boost does not make the thermal much better

One might suppose that being given an initial boost up the hill side would make the thermal grow faster and extend higher. This does not seem to be supported by calculations. The entrainment process depends largely on the rate of rise of the thermal. When it rises faster the entrainment is greater. The result is that the excess speed is soon lost once the thermal has risen clear of the hill side.

The vacuum cleaner effect

Some flat regions can build up a huge area of hot air just waiting for a trigger to release a thermal. Once a thermal has lifted off it is drifted along by the wind picking up more warm air. The air may rise as an almost continuous column or in a series of closely spaced bubbles plucked off by the thermal passing above. The result is a very long lasting thermal. The inward flow towards the base of the thermal can bring in air from several directions. If the surface air has a slight rotation initially the concentration under the thermal greatly increases the spin. Eventually this sets off a whirl visible as a dust devil. In desert regions dust devils can amble across the ground for many minutes and extend up to 7000ft or more. In the UK where solar heating is less powerful most dust devils are very short lived and rarely go up high. I have known them appear before anyone had realised it was soarable.

Strong winds

Strong winds cause turbulence which diverts the horizontal flow so that some of the fast moving air comes down to the ground. Then thermals seem to be torn off the ground before they are really read to go. As a result they seem unable to get properly organised until much higher up. There are very narrow and irregular bits of lift low down but seldom anything useful. Higher up thermals are apt to be narrow and usually rough too. Up at cloudbase thermals may be just as strong as on light wind days but low down they are too broken for circling. Sometimes flying straight into wind gives better results than turning.

Fig 9 shows thermals being pulled off the surface by the turbulent flow near the ground. They do not seem to form bubbles, at least not low

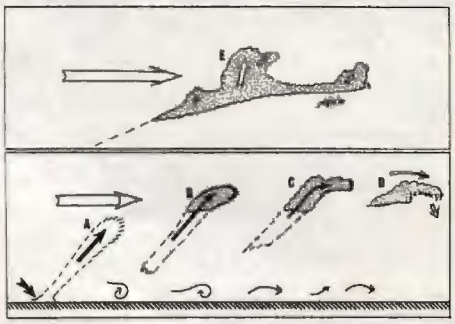


Fig 9

down. The air goes up as a ragged column, much to narrow for circling. At B it produces a scruffy patch of cloud. At C it loses momentum and the cloud is bent over and at D it decays. In the upper section cloud E has passed the condensation level with more energy and been revived. The odd bubble may push up from this cloud. With early thermals it is quite common to find the cloudbase slopes upward. On the windward side a tail marks the end of the plume. Tails are a feature of strong winds and weak thermals. (Photo 3.) I have not (so far) found any useful lift in these tails.

Life span of a cu cloud

There are a number of garrulous glider pilots who delight in telling their companions how good the lift is. Information about a particular thermal may boost the morale of the pilot astern but is seldom of practical use unless the two can see each other. Few thermals last long unless they are capped by big clouds which everyone else can see. On blue days a call saying "There is 8kt over Cowley" is seldom much help to the pilot leaving Didcot. This splendid thermal will usually have departed long before you get there.

How long a cumulus lasts seems to depend on several factors:

1. Volume of the cloud. The bigger the cloud the longer it will last.
2. The aspect ratio. Taking this as height divided by width, low aspect ratio clouds last longer. For example a tall thin cloud with an aspect ratio of 4 tends to have only ¼ the active life of a flat cloud with much width but little height. Photo 4 shows a low aspect ratio cloud which lasted many minutes. In contrast photo 5 shows high aspect ratio clouds whose thermals ended very quickly. If you extend a high aspect ratio cloud just as it starts you may be whisked up several thousand ➡

feet very fast, but only if you can stay in the bubble.

3. The time of day. Clouds have a shorter life in the morning than in the afternoon and the longest lasting thermals seem to be found in late afternoon.

4. The cloudbase. The bigger the thermal bubble and the cone of lift underneath the higher it can go. High cloudbases usually go with tall cones of lift and big bubbles on top. If the cloudbase is below 2000ft, as it may be when the first early morning cu appear, the bubbles are usually small and the clouds have a brief life. Little clouds may be dead in a couple of minutes. (But you will still see the remains five minutes longer.) On summer afternoons when the cloudbase is more like 5000ft the cone of lift can often be found a long way below cloud and the bubble on top is much larger than in the morning. Such large thermals have a long life – a quarter of an hour or longer.

Towards evening, even on days when the cloudbase is so close to the inversion that the cloud itself is very shallow, one may find small flat cumuli working for half an hour or more. At this stage the active clouds are nearly always much further apart than in the morning.

Group effect

When talking of cloud life one needs to distinguish individual cells from the groups or lines of clouds which last very much longer. Large clumps of cloud consist of many cells. The outside ones have a short life because they are exposed to erosion from the surrounding air. Cells near the middle of the group live a more sheltered existence. The outer ring of clouds protects them from erosion by contact with dry air so they can grow much larger. One can usually head towards a large cluster of cu with confidence that there is bound to be lift somewhere underneath, even if it takes fifteen minutes to get there. Isolated clouds are far less reliable. They may look good from a distance but too often start to expire just as you reach them.

Semi permanent thermal sources

Another system of clouds has a very long life. These have an underlying supply of warm air which doesn't become used up. In fairly calm weather a group of cu anchored to a mountain may stay there for hours, often until the sun goes down, provided the cloud does not grow so big that it puts the mountain slopes in shade. However, if you watch these orographic cu you will usually find that the individual towers have a short life; the bank of cloud remains active because it consists of a large family of cu all growing over the same region. As one tower collapses another rises nearby to take its place.

Cumulus streets

These usually have a long life too, but this is due to the special circulation where the air follows a helical path. Once again individual cells do not last much longer but the street is continually replenished by new cells so that its effective life is long.

Signs of active cumuli

One should look for two features:

1. A well defined domed top with little domes superimposed on larger ones. This shows that there has been a good thermal underneath. (But it may not be still working below cloudbase.)

2. The look of the base usually shows if a thermal is still feeding the cloud. An almost level base, flat for several hundred metres, nearly always shows that a thermal is still entering the cloud from below.

Soon after the thermal has ended the base loses its level appearance. The top may continue to grow for several more minutes after the base has begun to decay.

3. Steer well clear of any cu when the top breaks off and the base turns ragged. There may soon be a waterfall of invisible sink.

This article has barely scratched the surface. There is a great deal more to this subject which I hope to describe in the next part.

FLYING NEIGHBOURLY

Dick Stratton, BGA chief technical officer, gives an update on hush kits for glider tugs

Above: Booker GC's 180 Super Cub fitted with a Hoffmann four propeller. Photo: Mike Cuming. Below: Mike Barnett's photo of the Cambridge University GC's Rallye 180T with the adjustable Hoffmann propeller. Both aircraft have the Gomolzig silencer.

Because of noise complaints at several gliding clubs, particularly Lasham, the BGA Technical Committee entered this minefield of air worthiness aggravation by asking for a meeting with the CAA (Safety Regulation Group) on December 8, 1987. Six months later, after the Minister of Transport had had complaints, we were asked to meet their Policy 4 Division to explain our plan of action.

Supplementary type certificates (major modification approvals) had already been raised by various clubs, companies and individuals in the USA and Europe to fit four blade propellers and/or exhaust silencing systems to almost all types of aircraft used as tugs.

Quiet propellers

The Pawnee (PA25-235) had been fitted with a Hoffmann four blade propeller in the USA. The reduction in diameter, without significant change in rotational speed, reduces the blade tip velocities and reduces and modifies the noise characteristics. John Bally at Talgarth was the first to fit one in the UK with the flight testing at RAFGSA Bicester.

The propellers were then evaluated at Booker and Lasham on the Robin DR 300/400 series and on the Rallye 180T. Although both types of aircraft have the same Lycoming 0-360 (180hp) powerplant, it was necessary to fit propellers with different blade pitch angles for a performance that was equivalent or better than the standard two blade propeller. The climb performance of the Robin was improved by some 8%.

The Rallye series has a long history of failing to meet the flight manual schedule climb performance by 140ft/min and has been written down by CAA. However, flight testing by Lasham in 1988 established that the four blade propeller gives the same performance as the two blade with better acceleration and higher drag on descent. This latter feature is true of all four blade (fixed pitch) propellers.

Fabric covered aircraft such as the Pawnee, Piper Cub and Bellanca Citabria, are prone to propeller-flow induced excitation of the tailplane and empennage.

The four blade propellers exaggerate this problem and although they have been *STCd on a Cub (PA18-180) in Switzerland, in the UK we judged the level of vibration to be unacceptable. Hoffmann sent their design expert to meet the BGA and CAA and subsequent flight trials by the Cambridge University GC on their Super Cub (PA18-150) and Citabria with a propeller with a modified blade tip chord /thickness ratio produced acceptable levels of performance and less vibration.

Matching propellers to the various powerplant installations on a variety of aircraft types seems to be less than an exact science. To improve the probability of achieving optimum results, Skycraft can adjust the blade pitch of their four blade Hoffmann propeller on the ground. Thus the static rpm can be set close to the maximum permitted and flight trials conducted to ensure there isn't over-speeding in the climb as well as measuring the performance in the climb, cruising flight and in descent.

The static thrust (and the initial acceleration) can be measured by tying the tug to a tree *via* a tension meter, as Cody did at Farnborough in 1908. Only the technology has changed, not the technique!

Exhaust silencers

Having moderated the propeller noise, the exhaust system inevitably becomes the dominant source of noise. Tuned exhaust systems can be developed which enhance the power output of engines, particularly two-strokes. Typical aeroplane installations seem to acquire unsophisticated systems which neither optimise power or noise reduction.

Gomolzig GmbH in Germany have standardised a range of bolt on kits adapted to fit almost the entire range of typical light aircraft. (Beagle offered a truck silencer as a option on the Terrier.) Silencers are also available from other sources.

The kits weigh about 17lbs and otherwise don't detract from the aircraft's performance. Booker GC negotiated approval for the Gomolzig kits on the PA18 series and the BGA for the Robin DR 300/400 series – they are now hoping for approval for the Bellanca Citabria, Rallye, PA25-235 and 260 Pawnees.

While we can't expect these two modifications to produce a truly "Stealth" tug, there is no doubt clubs will become better neighbours, particularly if they use simple PR techniques to advertise what they have done. Incidentally, local authorities actually funded part of the cost of a "quiet" propeller for a certain club in Yorkshire and at Booker.

". . . slogging away at this programme since December 1987"

With others, I have been slogging away at this programme since December 1987. We have challenged and nominally changed the working practices of the CAA in investigating STCs. Recently the BGA chairman, Don Spottiswood, raised the matter with the CAA chairman, Christopher Chataway. The chairman of the Airworthiness Requirements Board, Rex Smith, OBE, who is also a member of the CAA Board, has been acting on our behalf and we have enlisted the support of the Dept of Transport in accelerating the outstanding CAA approvals, which have become more urgent as a result of planning constraints on unsilenced tugs.

(The approval of Mogas for use in aircraft in 1981 by the BGA was actually more fun!) The BGA are indebted to Michael Barnett of Skycraft and to several clubs involved for their sustained efforts in the face of extreme adversity.

If you are interested in exhaust silencer kits, please contact Michael Barnett, Skycraft Services Ltd, Albany House, Silver Street, Litlington, Cambs SG8 0QE (0763 852150).

Hoffmann propellers are also available from Skycraft or Soaring Equipment Ltd, 193 Russell Road, Moseley, Birmingham B13 8RR (021-449-1121).

Finally, some advice to SLMG operators who have multi-pitch propellers. You make quite a lot of noise on take-off and in the climb at full throttle. If it is safe to do so, why not practice a "fly neighbourly" technique of throttling back to reduce propeller tip speed.

*STC is the world-wide equivalent of a CAA major modification approval (Airworthiness Approval Note) and stands for Supplementary Type Certificate.

SAFETY AWARENESS PRESENTATIONS

The 1990 fatal accident record has been the worst ever. To try and improve this state of affairs the BGA plans a series of "Safety Awareness" presentations for *all* clubs during February to May. We may ask some of the smaller clubs to attend the same presentation at some mutually convenient venue.

The Framework. At best one presenter might be able to talk to a few hundred pilots. To talk to more requires a team and this has been set up on a regional basis. The material, consisting of video, and slides, will be the same at each of the venues and the presenters will all be "standardised".

Safety Awareness is the object of the exercise and for the most part the programme is educational. It is interesting to compare notes with the CAA to find that of the 20 000 aeroplane pilots in the UK 10 000 have attended the CAA safety presentations and only three of this number have been killed. Of the remaining 10 000 *who have not attended* 45 have been killed. It would seem that it's attitude that counts!

The Programme will include a lot of new material:

1. The RAF video – "The Spin Explained".
2. Pilot supervision, including reading a logbook and training progress cards (based on actual accidents).
3. Stalling/spinning on the winch launch, the "envelopes" of stalling speed/weak link protection against climb angle and airspeed.
4. Flight limitations, the loads on a glider during the winch launch and reasons for observing them.
5. Launching and launch failures is dealt with in a new German video.
6. The risks of flutter are not well understood, particularly the lower critical speed at greater heights (illustrated with a German Akaflieg flutter video).
7. The risks with motor gliders, particularly the critical aspects of break-off height for engine re-start.
8. Selecting suitable gliders for use by club and inexperienced pilot and type conversion.

Who should attend?

Everyone is eligible, from beginner to pundit, "old hand" and instructor. *We* are making the effort to bring you the presentation, so *you* make the effort to attend. *CFIs, this programme has a three-line whip requirement!*

Where? Look at your club noticeboard for details of the programme.

Bill Scull, *BGA director of operations*

BGA ACCIDENT SUMMARY

Edited by JOHN SHIPLEY
Chairman, BGA Safety Panel
Compiled by David Wright

Ref Number	Glider Type	BGA No	Damage	Date Time	Place	Pilot/Crew	Age	Injury	Hr
36	Skylark 3	954	W/O	10.04.91 1024	Galewood		43	N	23

In turbulent rotor conditions this early solo pilot found difficulty in keeping station behind the tug. The tug released at 100ft and due to the drift a turn was made to avoid buildings in front and ahead. Travelling sideways over a copse the tail snagged the tree tops and the glider descended through the trees and a hedge before stopping on a road.

37	Astir CS	2228	M	22.04.91 1512	Aboyne		45	N	110

After a normal touchdown the glider weathercocked and left the runway on to smooth grass at low speed. The undercarriage collapsed with four members failed. These die castings are thought to be brittle and liable to fracture under shock loading rather than *via* slower bending and buckling which could be detected before failure.

38	DG-200	2299	W/O	05.05.91 1425	Rufforth		46	M	53

While adjusting the flaps from negative to positive during the aerotow ground run the airbrakes came open. The glider lifted off and bounced before the pilot regained control and shut the brakes.Off tow the nose dropped 30° and a left bank developed. Unable to effect any pitch control the dive continued until the glider hit the ground.

39	Ventus B	3197	S	23.03.91 1645	Aboyne		47	N	863

After a 4hr wave flight the pilot selected too much flap and was unable to prevent the glider dropping a wing and entering a high speed groundloop. The glider was substantially damaged as it left the runway.

40	Falke	M/G G-AXIW	S	27.04.91 1718	Halesland		44	N	570+4700pwr
						P2	45	N	262

While training a SLMG PPL pupil P1 simulated an engine failure. The student over reacted and P1 was unable to prevent the aircraft hitting the ground hard from 30 to 50ft agl.The motor glider was substantially damaged but the crew escaped injury.

41	Nimbus 2c	2507	S	04.05.91 1840	Lasham		52	N	1790

On a marginal final glide into a 20kt headwind the glider encountered severe sink overflying a selected undershoot field. It stalled into the boundary hedge and came to rest inverted with the pilot hanging from his straps 10ft above a road. After radioing for help he was released and lowered uninjured to the ground.

42	Olympia 460	–	M	25.09.90 1440	Nr Eaglescott		52	N	128

Late 1990 report! After a normal field landing the glider sunk into the soft surface and pitched forward. The chosen field turned out to be rough furrowed across the landing direction but was covered with lime sand. An adjacent grass field should have been used.

43	SHK 1	–	S	21.04.91 1707	Feshiebridge		30	N	152

The glider was launched as a snow shower approached. The pilot saw that it was a severe shower but delayed his landing by soaring the updraft preceeding it. As a result he had to land in poor visibility and the storm and clipped trees downwind of the boundary, then hit a hangar with the left wing. This slewed the glider around and it landed in rough ground.

44	Pirat	1952	M	28.04.91 1600	Snitterfield		67	N	?

The pilot chose to land between a landed glider and the retrieve winch. The glider touched down beyond the winch and then the pilot saw the retrieve cable angling across his wing. This pulled the wing down causing the glider to veer to the right before stopping.

45	K-6E	1452	S	12.05.91 1430	Nr Sydenham		37	N	548

While local soaring, height was lost so the pilot picked a field then continued scratching until had no choice but to land. He approached over powerwires with full airbrake and landed in the last quarter of the field. The glider was groundlooped to avoid the hedge. The field was too small with the obstructed approach and there was no headwind.

46	Not applicable	–	3P	08.05.91 1915	Dalladhy		0	–	–

The winch was near the club buildings with parked cars at one end of the runway. Following a launch, with no crosswind, the cable fell across two cars and narrowly missed a member. In future the winch will be positioned downwind of the car-park entrance.

47	Grob Twin Acro 3	3524	W/O	11.05.91 1030	Parham		38	N	163
						P2	67	S	0

In a light crosswind P1 allowed P2 to position the glider too high and fast and did not take control until over the boundary. Full brake and sideslip was not enough to make a normal landing, so he turned to land across the end of the field but then had to turn away to avoid a tug. The turn was too slow and the glider spun in with the brakes out.

48	Skylark 3F	922	W/O	04.05.91 1530	Lybury North		40	N	29

During a 50km attempt a field landing became necessary but the pilot left the decision too late and chose a field with high trees and buildings on the approach. He did not allow for these on his approach and the glider stalled in the turbulence behind the trees and crashed after hitting a small tree.

49	Astir Club	2437	W/O	25.05.91 –	Sutton Bank		40	F	2

This fatal accident occurred on the pilot's first flight on type. After a slow initial launch the glider was rotated into an apparently normal climb attitude until the cable came away at about 500ft. The glider was seen to pitch nose down until over the vertical and crashed. He was an experienced hang glider pilot. Full BGA report awaited.

50	T-21B	1000	M	05.05.91 –	Gamston		28	N	164
						P2	29	N	0

After a cable break at about 10ft the pilot lowered the nose and after a short delay opened the airbrakes. This made the glider land heavily then bounce back into the air before a normal touchdown.

51	Astir CS	2162	M	19.05.91 1600	Aboyne		37	N	27

During a 2hr wave flight the early solo pilot failed to notice that the wind had strengthened at airfield level. He misjudged his circuit and drifted too far downwind. Despite changing to an out of wind runway he undershot on to rough ground and collapsed the undercarriage.

52	K-7	3421	N	14.04.91 1246	Kitson's Field		41	N	?
						P2	47	N	0

While correcting for drift during landing the left hand rudder cable broke at a ferrule causing damage to the right rudder stop. This was the second time recently this had occurred. The swaging tool required adjustment to produce a secure joint. A test specimen has been made up for proof testing.

BGA AGM/DINNER-DANCE

The BGA AGM/dinner-dance and prize-giving will be at the Post House, Crick, Northants on Saturday, February 22. For a booking form which includes details of a special package to stay overnight, contact the BGA office.

OBITUARY

RUDOLF KAISER

Photo: Peter Selinger.

Rudolf Kaiser died on September 11, the day after his 69th birthday. Gliding has lost a man to whom we all owe a debt of gratitude. There can be very few glider pilots who have never flown a Kaiser designed glider, and none at all who have never heard others speak with real affection of the qualities of such gliders as the K-6, the K-8, the K-13 and the K-21. Rudolf's name will live on for many years to come in the 5000 or so gliders built to his designs, many of which still form the backbone of club fleets throughout the world.

Rudolf was destined to take over the family butcher's shop in Coburg. However, the war intervened and after service in the Luftwaffe (during which he obtained his C certificate), he gained a civil engineering diploma in 1952. He never had any instruction in aeronautical engineering, nor did he ever belong to an "Akaflieg", the usual spawning ground of successful glider designers in Germany. Everything he needed to know about glider design and construction he taught himself, although he always gave due credit to his mentor, Walter Stender.

Kaiser built his first glider (subsequently dubbed "K-1") at home for his own use during the winter of 1951/2, as soon as the post-war ban on aircraft construction had been lifted. He achieved his Silver badge in this aircraft. In the early 1950s, Kaiser worked for both Alexander Schleicher at Poppenhausen and for Egon Scheibe, producing classic designs such as the K-4 ("Rhönlerche") and the Zugvogel 1.

Ref Number	Glider Type	BGA No	Damage	Date Time	Place		Pilot/Crew Age	Injury	Hr
53	K-7	3362	M	17.04.91 1230	Kitson's Field	P2	48 53	N N	988 0

At 300ft in the winch launch the pilot signalled "too fast" then as normal speed was resumed the rear canopy blew open and smashed. P1 took control and landed normally. The canopy side lugs that locate it when closed and take the side loads were found to be missing.

54	Twin Astir	2323	M	28.04.91 1445	Sleap	P2	64 34	N N	3300 0

After flying a sortie with the wheel extended it was retracted by P2 during the downwind check. The warning hooter sounded but P1 advised P2 "to ignore the noise" due to a history of unreliable warnings on this glider. A wheel up landing was made.

55	SZD Junior	3418	N	25.05.91 –	Challock		0	N	–

After rigging, a DI, **and three flights** the elevator connection was suspected to be incorrectly connected. A tap on the top of the tailplane resulted in disconnection of the push rod. The locking sleeve had not been pushed up fully.

56	Carmam JP15/36AR	3450	M	23.06.91 1335	Nr St Austell		46	N	117

After selecting a field from about 1500ft on a Silver distance attempt the pilot made a normal circuit and landing. However the grass was longer than anticipated and the wingtip caught in it, causing a groundloop.

57	K-13	3163	S	28.05.91 –	Lasham	P2	26 28	M N	650 0

During the second day of a course P1 allowed P2 to fly the approach under his instructions. P2 expressed concern about a nearby mast and P1, in assuring that there was no problem, allowed his student to get too slow with a high rate of descent and 3/4 airbrake. P1 pulled back to reduce the rate of descent and the tail skid hit the ground hard.

58	Capstan	1118	M	25.05.91 –	Culdrose		70	N	5

After a normal, half airbrake approach into a 20kt headwind, the glider touched down gently then ballooned back into the air. The early solo pilot eased the brakes in. Then, as the glider levelled at about 5ft, opened them fully causing a hard landing on the nose.

59	Grob G109	M/G G-BRCG	N	17.03.91 1230	Nr Enstone	51 P2	N 44	173 & 105pwr N	–

The motor glider's engine was stopped within gliding range of the airfield. When the crew tried to restart it would not and an uneventful field landing was made. Inspection showed that the alternator had not been charging due to a disconnected spade connector. The crew had not noticed the failing voltmeter reading over several flights.

60	ASW-20BL	2974	M	11.05.91 1730	Aston Down		0	N	–

While removing the glider from its trolley in the hangar the owner, with his weight on one foot, overbalanced and leant against the canopy, cracking it.

61	PIK-20D	2537	M	02.06.91 1300	Steeple-Claydon		32	N	1130

On a cross-country flight the pilot chose a small field in a cropped area. There were telephone wires on the approach and the circuit was flown in light rain. The pilot undershot and hit and severed the cables damaging the fin and forcing the glider to land heavily.

62	Bocian 1E	1995	M	26.05.91 1515	Dallachy	P2	56 0	M N	101 0

As P1 rotated the glider into the climb the winch cable broke and the speed fell. Probably due to an expected "flat spot" in the winch power at this stage P1 did not lower the nose promptly enough and the glider mushed into the ground, right wing first and groundlooped. (P1's back may have been less bruised if energy absorbing foam was used?)

63	SZD Junior	3418	M	05.06.91	Challock		45	N	128

At 450ft during the winch launch the pilot signalled "too fast" and the canopy flew open. Holding it closed with one hand the pilot flew an abbreviated circuit with a sideslip approach (no airbrake) and landed safely. The pilot had closed but not locked the canopy.

64	K-13	3573	M	01.06.91	Aston Down	P2	33 35	N N	632 0

P2 flew a normal circuit with prompting from P1 until, after a slightly steeper than normal approach, he was asked to round out and flare. P2 moved the stick back rather too sharply and the glider landed tail skid first. Although this was not hard a tube was fractured inside the fuselage. This was hidden by fabric and not visible in a DI.

65	Astir CS77	–	M	14.06.91	Connel		49	N	13

The pilot abandoned a slow auto launch at about 500ft and put on speed (80kt) before completing a short circuit and starting the approach with full airbrakes. The glider touched down fast and bounced back into the air before landing heavily when the undercarriage collapsed.

66	ASW-20	2453	N	09.05.91	Dunstable		35	N	951

After confirming with an inspector that the retaped controls were giving no problems the pilot took off only to find that when flap 2 was selected the glider rolled to the right. By re-selecting less flap the pilot was just able to land safely by turning only right. The wing/aileron tape had restricted aileron movement.

67	Falke	M/G G-BFDA	M	16.06.91 1300	Pocklington	P2	43 53	N N	400+29 pwr –

The motor glider pilot did not hold the stick fully back on landing and the aircraft bounced back into the air. The second touchdown was made normally but the pilot lost his grip on the stick and the aircraft tipped forward damaging the propeller tips on the runway.

68	Vega 17	2550	M	06.06.91 1735	Membury		25	N	465

During a cross-country flight the pilot had to land out so chose a nearby airfield where one glider had already landed. He landed on the same runway but his wingtip caught in the tall crop at the side of the runway and caused a groundloop. A wider, less into wind, runway was available and could have been used.

69	Discus	3523	S	21.06.91 1600	Kimbolton		31	N	470

During a competition the pilot chose to land on a disused airfield. A 25ft mound of earth alongside the approach path caused curl over and the left wing was pushed down into the crop, groundlooping the glider. The fuselage was broken and the nose damaged.

70	K-7	–	M	01.06.91 1250	Winthorpe	P2	0 0	N N	– –

As the K-8 was pushed back into line it was manoeuvred too close to a lined up two-seater and the wingtip struck the latter's fin causing an 8in split in the plywood.

71	Blanik	2008	S?	18.06.91 1930	Enstone	P2	29 0	N N	200 0

The pilot chose to land well down the runway and then cross on to the grassway alongside it to reduce the walking distance to the hangar. The glider hit a rut and the undercarriage collapsed as the mounting failed.

72	Sport Vega	2616	M	30.06.91 1500	Crowland		50	N	38

After a short soaring flight a circuit was set up to land across a cropped field on to the into wind runway. His aiming point at the end of the runway turned out to be 50 yards into the crop which changed colour here and merged into the airfield grass. The wing caught in the crop causing a groundloop.

➡

But it was with the K-6 that Kaiser brought the era of the wooden glider to a glorious apotheosis. Winner of the OSTIV prize for the best Standard Class glider in 1959, the K-6 was flown to victory in the World Championships by Heinz Huth in 1960 and 1963. No fewer than 1368 K-6s were built, many of which, 30 years later, are still flying and much prized by their owners.

Rudolf Kaiser's activities in no way diminished with the advent of glass-fibre construction methods. His K-21 two-seater trainer was widely adopted as the natural successor to his popular K-7 and K-13 designs. His last design, the K-23, was an early solo machine designed to mirror the characteristics of the K-21. He retired after it had made its first successful test flight in 1983. Sadly, his retirement years were marred by increasing ill health which prevented him from flying as much as he would have wished.

A quiet, modest man, Rudolf Kaiser was described by Hans Werner Grosse as "a great stroke of luck for gliding". His fellow designer at Schleicher, Gerhard Waibel, commented: "Rudolf Kaiser's gliders are not only well designed, they are just beautiful."

Text distilled by Max Bishop from notices in *Aerokurier* and *FAZ*.

Ref Number	Glider Type	BGA No	Damage	Date Time	Place	Pilot/Crew Age	Injury	Hr
73	Olympia 463	1370	M	30.06.91 1258	Newcastle & Tees	32	N	52

The glider was seen to approach rather high and fast and then balloon on touchdown. The left wing dropped and the glider drifted to the side of the runway and landed in rough ground damaging the wing mountings.

74	SZD Junior	–	M	29.06.91 1306	Kitson's Field	64	N	116

The cable weak link broke at 300ft on a fast winch launch (70kt) before the pilot could release. He lowered the nose but then allowed the speed to build up and, after a series of PIOs, the glider landed heavily, bounced into the air then landed normally. The pilot had just returned after a winter lay-off and this was his first flight on type.

75	Pegasus	3296	M	14.07.91 1600	Nr Peterborough	54	N	1710

On a cross-country the pilot found he had to land in an area of poor fields. The selected hay field was one third cut and only had a small clear, into wind run. At touchdown the wing caught in the crop and spun the glider around causing it damage.

76	SF-27	–	M	29.06.91 1530	Kitson's Field	48	N	24

The pilot was flying a sideslipping approach when the canopy flew off and was smashed but he was able to land normally. It is probable that the locking rod was not fully engaged. The black rod was difficult to see in the dark recess and so a contrasting paint scheme will be applied to improve checkability.

77	Vega	2577	M?	14.07.91 1230	Galewood	43	N	280

After approaching high, due to the gusty conditions and to clear a lined up glider, the pilot opened the brakes fully. The glider then dropped on to the runway through the severe wind gradient and landed heavily, cracking the fuselage and damaging the undercarriage. The energy absorbing foam seat helped prevent injury.

78	Std Libelle	1662	M	07.07.91 1100	Waddingham	35	N	101

At 2000ft the canopy became detatched as soon as the canopy vent was opened. The pilot landed safely. During his pre-flight checks he had not been able to detect that it was unlocked by pushing up on the canopy. No fault was found with the mechanism.

79	Astir cs	2186	N	05.07.91 1515	Usk	38	N	110

The pilot chose to abandon his circuit at 550ft and try to thermal. However, he lost 150ft and had to land in the undershoot field. While doing this he neglected to lower the undercarriage and landed on the glider's belly.

80	Club Libelle	3746	W/O	14.07.91 1305	Snitterfield	42	F	6

This was a **fatal** winch launch accident. Initial reports suggest that the glider's wing dropped during the ground run and this upset the launch which continued to about 300ft. At this time the glider rolled inverted then crashed with the cable still attached. Full BGA report awaited.

81	Puchacz	3391	W/O	28.07.91 1455	Rviar Hill	54 P2 40	F F	– 0

Fatal winch launch. After a possibly slow launch to 1000ft the glider was seen to spin twice to the left, recover, then spin to the right and crash. All controls were found intact. Spin recovery on this type is normal except if the control column is held hard back against the stops it will flick into a spin in the opposite direction.

F=Fatal; S=Serious; W/O=Write-off; M=Minor; N=Nil

GLIDING CERTIFICATES

ALL THREE DIAMONDS

No.	Name	Club	1991
363	Hamblin, P.R.	Surrey & Hants	18.8
364	Whitehead, M.A.	Cambridge Univ	18.8
365	Thomas, D.J.	Bristol & Glos	18.8
366	Woods, Virginia	Lasham	18.8
367	Naegeli, P.	Lasham	22.9
368	Ley, J.M.	Essex	18.8

DIAMOND DISTANCE

No.	Name	Club	1991
1/533	Walker, P.B.	Bristol & Glos	18.8
1/534	Davis, P.	Lasham	18.8
1/535	Chapman, C.J.	Cambridge Univ	18.8
1/536	Lemin, R.	Bristol & Glos	18.8
1/537	Hamblin, P.R.	Surrey & Hants	18.8
1/538	Thompson, R.J.	Chilterns	18.8
1/539	Jobar, R.S.	Lasham	18.8
1/540	Whitehead, M.A.	Cambridge Univ	18.8
1/541	Starling, R.T.	Bristol & Glos	18.8
1/542	Kite, P.J.	Lasham	18.8
1/543	Thomas, D.J.	Bristol & Glos	18.8
1/544	North, S.H.	Bath & Wilts	18.8
1/545	Woods, Virginia	Lasham	18.8
1/546	Naegeli, P.	Lasham	18.8
1/547	Hinder, G.J.	Lasham	18.8
1/548	Croote, P.F.J.	Mendip	18.8
1/549	Henderson, P.J.	Southdown	18.8
1/550	King, R.A.F.	London	18.8
1/551	Jones, P.R.	Fenland	18.8
1/552	Ley, J.M.	Essex	18.8
1/553	Walker, J.P.	Coventry	18.8
1/554	Thackray, S.	Vale of WH	18.8

DIAMOND GOAL

No.	Name	Club	1991
2/1977	Garrett, J.T.	Bicester	18.8
2/1978	Bolton, M.G.	London	18.8
2/1979	Walker, P.B.	Bristol & Glos	18.8
2/1980	Payne, K.W.	Welland	13.8
2/1981	Jobar, R.S.	Lasham	18.8
2/1982	Bramwell, D.S.	Upward Bound	14.8
2/1983	Browning, T.P.	Lasham	12.8
2/1984	Gordon, J.S.	Oxford	18.8
2/1985	Mee, M.P.	Booker	18.8
2/1986	Green, I.R.	Imperial College	18.8
2/1987	Levitt, M.	Cotswold (in France)	14.8
2/1988	Mansfield, P.	Vale of WH	18.8
2/1989	Challoner, A.V.J.	Southdown	18.8
2/1990	Kingston, M.E.	Cranfield	18.8
2/1991	Starling, R.A.	Cranfield	18.8
2/1992	Thorn, J.E.	Bristol & Glos	18.8
2/1993	Hallam, J.A.	Bicester	8.8
2/1994	Ruttle, D.M.	Humber	18.8
2/1995	King, R.A.F.	London	18.8
2/1996	Manktelow, S.A.	Cotswold	18.8
2/1997	Prater, G.V.	Lasham	18.8
2/1998	Owen, M.	Fenland	18.8
2/1999	Tillett, N.D.	London	14.8
2/2000	Todd, A.L.	Lasham	25.8
2/2001	Bartlett, B.R.	Southdown	18.8
2/2002	Smith, I.F.	Lasham	18.8
2/2003	Moyse, R.	Lasham	18.8
2/2004	Swoffer, Lorraine	Lasham	18.8
2/2005	Dungey, D.	Avon	18.8
2/2006	Steed, D.M.	London	18.8
2/2007	Jones, P.J.	Booker	26.8
2/2008	Gough, N.J.	Four Counties	26.8
2/2009	a Court, J.W.	Lasham	26.8

DIAMOND HEIGHT

No.	Name	Club	1991
3/1036	Ward, O.M.	Cotswold	15.8
3/1037	Naegeli, P.	Lasham	22.9
3/1038	Hoare, N.	London	17.9

GOLD BADGE

No.	Name	Club	1991
1565	Mee, M.P.	Booker	18.8
1566	Challoner, A.V.J.	Southdown	18.8
1567	Kingston, M.E.	Cranfield	18.8
1568	Harris, Elizabeth	London	18.8
1569	Ruttle, D.M.	Humber	18.8
1570	King, R.A.F.	London	18.8
1571	Manktelow, S.A.	Cotswold	18.8
1572	Todd, A.L.	Lasham	25.8
1573	Bell, Christine	Kent	18.8
1574	Dungey, D.	Avon	18.8

GOLD DISTANCE

Name	Club	1991
Garrett, J.T.	Bicester	18.8
Bolton, M.G.	London	18.8
Payne, K.W.	Welland	13.8
Bramwell, D.S.	Upward Bound Trust	14.8
Browning, T.P.	Lasham	12.8
Mee, M.P.	Booker	18.8
Green, I.R.	Imperial College	18.8
Levitt, M.	Cotswold (in France)	14.8
Mansfield, P.	Vale of WH	18.8
Challoner, A.V.J.	Southdown	18.8
Kingston, M.E.	Cranfield	18.8
Starling, R.A.	Newark & Notts	18.8
Thorne, J.E.	Bristol & Glos	18.8
Harris, Elizabeth	London	18.8
Weatherhead, A.E.	Cranfield	18.8
Hallam, J.A.	Bicester	8.8
Ellis, R.C.W.	Coventry	18.8
Ruttle, D.M.	Humber	18.8
King, R.A.F.	London	18.8
Manktelow, S.A.	Cotswold	18.8
Prater, G.V.	Lasham	18.8
Owen, M.	Fenland	18.8
Tillett, N.D.	London	14.8
Todd, A.L.	Lasham	25.8
Goodyer, B.	Mendip	18.8
Bartlett, B.R.	Southdown	18.8
Smith, I.F.	Lasham	18.8
Moyse, R.	Lasham	18.8
Swoffer, Lorraine	Lasham	18.8
Bell, Christine	Kent	18.8
Dungey, D.	Avon	18.8
Steed, D.M.	London	18.8
Jones, P.J.	Booker	26.8
Gough, N.J.	Four Counties	26.8
a Court, J.W.	Lasham	26.8

➡

In the air or on the ground the **SZD 55** looks like what it is – the best of the Standard Class.

Empty weight – 484lbs
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GOLD HEIGHT

Name	*Club*	*1991*
Ward, O.M.	Cotswold	15.8
Dean, J.O.	Glyndwr	15.8
Hoare, N.	London	17.9
Mercy, A.C.	Thruxton	3.1

SILVER BADGE

No.	*Name*	*Club*	*1991*
8797	Jones, A.	Blackpool & Fylde	31.8
8798	Fenton, D.S.	South Wales	19.9
8799	Long, C.	Avon	18.8
8800	Wild, M.	Lasham	18.8
8801	Foster, J.	Cotswold	15.8
8802	Esden, M.G.	Welland	28.8
8803	Smith, M.B.	Booker	27.8
8804	Oldfield, G.	Northumbria	12.9
8805	Corcoran, M.J.	Derby & Lancs	2.1
8806	Wilkinson, B.R.	Wrekin	22.9.90
8807	Kaye, P.D.	Sackville	26.8
8808	Allison, Anne	Chilterns	18.8
8809	Kennedy, J.J.	SGU	7.8
8810	Rumble, L.W.	East Sussex	19.9
8811	Budgen, M.T.N.	Portsmouth Naval	20.9
8812	Martyn, R.H.W.	Booker	18.8
8813	Hippel, A.	London	2.1
8814	Fielder, R.A.	East Sussex	6.1
8815	Riggott, N.	Lasham	24.8
8816	Hartland, G.S.	Midland	19.9
8817	Caldwell, D.J.	SGU	19.1
8818	Todd, A.L.	Lasham	18.8
8819	Brunning, Serena	Chilterns	2.11
8820	Wright, I.P.	SGU	9.11
8821	Murfitt, J.P.	Cambridge Univ	12.8
8822	Mercy, A.C.	Thruxton	3.1
8823	Le Roux, D.	Devon & Somerset	14.8

UK CROSS-COUNTRY DIPLOMA

Part 1

Name	Club	1991
Hinder, M.J.	Buckminster	14.8
Bolton, M.G.	London	18.8
Dann, R.J.G.	Shalbourne	13.8
Brown, V.L.	Stratford on Avon	18.8
Stone, Roberta	Cranwell	24.8
Todd, A.L.	Lasham	18.8

Gary Bennett, the disabled pilot who in the October issue, p231, offered to help others in a similar situation with adapting a glider or finding a sympathetic club, has a new telephone number – 0493 722 172. He also points out he was wrong in saying there are no disabled instructors – Bruno from RAF Honington is a full Cat. Gary is helping to raise money to modify a single-seater and anyone wanting to contribute should send cheques to Sportability Glider Appeal, c/o A. D. Musk, Sheenash, Ashwell Thorpe, Norwich.

TEAM MANAGER

Ben Watson has retired as British team manager. If anyone is interested in taking on some of the duties would they please contact the BGA office.

TURBO GLIDERS

Turbo gliders can now be considered as motor gliders and with motor gliders don't need to self-launch on record attempts for UK local records only.

CLUB NEWS

Copy and photographs for the April-May 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 February 11 and for the June-July issue to arrive not later than April 7. The fax number has been changed and is now 0223 413793.

GILLIAN BRYCE-SMITH
December 4

The Midland GC's new winch (Skylaunch) being driven by Peter Salisbury.

ANGLIA (RAF Wattisham)
Congratulations to Keith Shearer on going solo. Work is slow but steady on our new airfield bus and we will have completely refurbished our wooden fleet when we finish the K-13 and R51, thanks to dedicated hands. Our thanks also to Bicester for finding us a transfer gear box for our No. 2 bus winch.
J.R.C.

ANGUS (Arbroath)
We have replaced the club Pirat with a Std Jantar 2 and bought the K-6 previously owned by M. Davies to join our Bocian and SF-34.

Congratulations to M. Clarke and G. Clark on their Bronze badges. At our very successful wave expedition at Aboyne the SF-34 went to 10 200ft in wave and the Jantar to 8000ft.

At the AGM, S. Ingram, C. Wight and G. Clark joined the committee.
D.P.

AQUILA (Hinton in the Hedges)
The season finished reasonably well with Silver badges for Karl Emerson, Steve Blackmore, Bob Murray, John Cooper, Simon Kroner and Richard Eastburn (whose father Mel kept ahead with a 100km diploma). Congratulations also to Tony Limb on becoming an assistant Cat.

Expeditions to Le Blanc, Lleweni Parc and Aboyne brought some successes, especially for Simon Kroner who scored a badge leg wherever he went.

The new K-13 is a welcome addition to the fleet. We are levelling and seeding a grass runway next to the concrete 06/24.
D.McK.

BATH (Keevil Airfield)
We've made it! We have planning permission for our new site, "The Park". Building work starts in the new year and we should be installed by June.

Stuart North flew 500km during the Shalbourne soaring week. Our annual bash was great with awards going to Stuart North, Bob and Colin Hitchin, Malcolm Smith and Steveski. Congratulations also to Jamie King and Steve Gregory (Bronze badges) and Pete Dean (going solo).

A new DG-300 has joined the private fleet. The flying sequences in TV's "The House of Eliott" kept us amused as they were shot at Keevil with many members as extras.
B.H.

BICESTER (RAFGSA Centre)
Though the weather wasn't spectacular, we had some excellent flights at Aboyne. Congratulations to Neville Weir, Derren Francis, Paul Jessop, Gary Bennett and Alan Clarke on Diamond heights and "Spud" Hallam, Yvonne Clarke and Davy Rae on Gold.

Congratulations also to "Spud" on being presented at our Christmas dinner-dance with a trophy for the most meritorious flight (300km in a K-18) donated in memory of Paddy Hogg by his employers.
C.A.D.

BLACK MOUNTAIN (Talgarth)
In the winter knowledgeable pilots leave their flat sites for the mountains – fortunately the chairman and Tuggy have resurfaced the road leading to the airfield.

Due mainly to Keith Richards, the T-21 (which is so popular it logged 80hrs in ten weeks) has had its wings re-covered.

Several gliders reached more than 12 000ft in some fine mid November wave.
D.U.

Below: Norfolk GC members who have been learning from the Devon & Somerset GC winch driver, Dave Roberts (grey flying suit), how to use their new Supacat winch. Nick Jones of Supacat is on the far right.

BOOKER (Wycombe Air Park)
We have early morning flying during the winter weekends; impromptu expeditions for private owners, the first being a weekend at Shobdon with a tug and 11 gliders (including three ASH-25s) and intend short notice trips to use wave and ridge conditions within two to three hours drive of Booker.

This coming season there will be an increased emphasis on soaring and cross-country training for our pilots and visitors.
R.N.

BORDERS (Galewood)
We had three successful flying weeks with Sackville visitors enjoying good hill soaring and wave climbs to 8000ft. More turbulent conditions recently took us to 18 000ft.

Antonia Johnson has her 5hrs; Andy Henderson has brought a beautiful Std Jantar over from Germany and our imported and refurbished Bijave makes an unusual entry in the logbook for visitors having a check flight.
R.C.

BRISTOL & GLOUCESTERSHIRE (Nympsfield)
Seven pilots went solo on August 18 including Richard Starling, Ray Lemin, Phil Walker, Dave Greenhill, Mike Strathern and Derek Thomas.

Our new winch has significantly improved the launch rate. We are in the process of getting a full-time CFI.
H.E.

Obituary – Rosemary Sandford
She loved and was passionately interested in everything to do with the club. Rosemary started gliding in 1955 when the club was the Bristol GC and based at Lulsgate.

In 1958, when the BBC made a series of programmes about gliding, she "re-soloed", starring as the pupil in the series. She flew cross-countries with Peter Scott in his Eagle and with Tony Gaze in his Eagle in 1961 broke the British National Two-seater goal and return record with a 170 miles flight, Nympsfield, Oswestry.

Rosemary served on the committee in many capacities and helped organise our first competitions. Her memory for names and faces was renowned – it wasn't just a good memory, she was avidly interested in people as she was in all aspects of aviation.
Nancy Barrett

BRITISH FORCES GERMANY
Our expedition to Czechoslovakia in July was a great success with a Silver distance for Neill

John Heath presenting the Adrian Heath memorial trophy for London GC's most promising cadet in memory of his son, one of seven cadets sponsored by the club. Tragically Adrian was killed in a road accident. Photo: John Wood (Herald & Post).

Cockburn. Guy Jarvis completed his Silver badge with a 50km flight.

Our CFI's son, Phillip Harris, went solo at the age of 14 at the local German club where such events are legal. His instructor, Hein Köster, was one of his father's students who soloed in 1978.
E.S.

BUCKMINSTER (Saltby Airfield)
We had a busy end to a reasonable year. At the annual dinner cups were presented to Helen Cheetham; Russell Cheetham; Mike Hinder; Mike Calvert; the Looms family and Jill Woodman. Well done.

John Harwood and Jan Bassett have overhauled the winch and our thanks also to all who have helped on the site. Congratulations to Dave Housley and Roger Keay on becoming assistant Cats and to Mike Entwisle on a late 100km diploma.

Nottingham Polytechnic GC are hosting the Inter-University task week at Saltby. Our bonfire night was a great success.
M.E.

Borders GC's refurbished Bijave.

CAMBRIDGE UNIVERSITY (Gransden Lodge)
Obituary – John Burton
We are sad to record the death from cancer of John Burton. A member since 1956, he loved all forms of flying, and although he had not been active with us recently he will be fondly remembered for his generosity in giving us our K-6. Our sympathy goes to Judith and their two sons in their great loss.
B. H. Bryce-Smith

CLEVELANDS (RAF Dishforth)
We were sorry to hear of the death of our president, Air Marshal Sir Leslie Mavor, who had always taken a great interest in the club and flown frequently. Our sympathy to Lady Mavor, Richard and family.

Leeds University have added a K-2 to our fleet. Their old T-21 is still held in affection and been bought by a large syndicate.

Congratulations to Ric Cole on going solo just after his 16th birthday.
J.P.

COTSWOLD (Aston Down)
Congratulations to Tony Housden and Jane Randle on their 500kms (Tony completing all three Diamonds) and to Mike Barney and Steve Manktelow on their 300kms. Simon Housden was 4th in the Junior Nationals and Doug Gardiner won the Edgehill Regionals.

Many members flew in the Open Class Nationals in superb weather. Richard Burgoyne and Dave Moore have their AEI ratings. Our annual dinner-dance is on February 1.
G.M.

COVENTRY (Husbands Bosworth)
We have a series of winter weekend courses for solo pilots to include cloud flying, aerobatics and field landing training.

The club fleet is being refurbished and we have ordered a new Discus. Ron Bridges is directing our Regionals from August 8-16 and we are also taking bookings for courses.
T.W.

CRANWELL (RAFGSA)
Having improved on last season's statistics, we have two wave expeditions – our traditional camp at Clevelands GC at Christmas and a visit to Lleweni Parc.

We had an enjoyable AGM and party and congratulate the prize-winners;- "Skippy" Harper (two); Brian Hutchinson (two); Darren Smith (two); Mick Smith; Ian Mountain; Al Clarke; Bobbie Stone; Barry Briggs; Mick Lee and Neville Weir. An aviation painting was presented to our outgoing CFI Mick Lee as a thank you for his six years' hard work.

Congratulations to "Skippy" Harper and Bobbie Stone (AEI ratings) and Angie Tapson and Brian Hutchinson (PPL SLMGs). We welcome back Phil Becker after his sojourn as CFI ➡

Below: Culdrose GC members at Aboyne in September.

at Strubby; also a replacement Astir for the club and another privately owned SHK.
I.M.

CULDROSE (RNAS Helston)
Flying during late 1991 was very limited. Because of moves Dermot Hickey takes over as treasurer from Andy Hilary; Keith "Robbie" Robinson as technical officer from Pete Pengilly and we also say goodbye to Dave Brown. Our thanks for their help and good wishes for the future.
R.D.

DARTMOOR (Brentor)
Dartmoor's evil side is showing itself with gales, torrential rain and violent hailstorms. However, Bob Hawley flew Silver distance and we had some Silver heights.

Alan Holland ran a field landing course; some members visited Talgarth with CFI Peter Williams returning happy after 17½hrs from seven flights and Jim Gale gave a most interesting winter lecture.
F.G.M.

DEESIDE (Aboyne Airfield)
At the annual dinner-dance awards were presented to Bob Dall; Lemmy Tanner; James Davidson; Mike Law and Paul Boath. Congratulations also to Alistair Stark and Bob Dall (AEI ratings) and to Alistair on completing his Silver badge; Steve Kentish (Diamond height on his birthday) and Joe Kovacs (Gold height).

We have only a few places available on our 1992 autumn wave season. Contact Fiona Bick on 05055 4382 to check available dates.
G.D.

DERBY & LANCS (Camphill)
The Christmas party was again a tremendous success as was Neighbours' Night, a thank you for local farmers.

Congratulations to Robert Sprungli, Bryan Hamlet and Nigel Hodkinson (going solo) and to Colin Westbrook (Bronze badge). Peter Gray has retired as chairman – our thanks for all his hard work. All the club fleet are being refurbished.
M.I.R.

Obituary – Lawrence Ralph Robertson
Lawrence Robertson, who died in August at the age of 76, was closely connected with gliding and Camphill in particular for 58 years. He joined the Imperial College GC in 1933 and gained his Silver badge at Camphill in 1937.

A civil engineer, Lawrence was in charge of building the roads and supervised the laying of the hangar floor which during the war withstood the strain of many tons of newsprint stored at no small financial benefit to the club. For his invaluable services he was made an honorary member.

During the war he was an RAF engineer officer and afterwards flew regularly at Camphill and visited many European clubs. He was a great innovator and introduced our members to Challes-les-Eaux and to Latrigg, Keswick where he retired.

Dukeries GC's member David Britt after going solo. Photo: Barrie Codling.

Lawrence was a quiet, retiring man who hesitated to put in his penn'orth but his vast experience made him well worth listening to. He collected many Camphill trophies, including the prize in 1952 for the first flight to Blackpool, competed in the 1937 Nationals, and had a Gold badge.

Our sympathy goes out to his family. He will be remembered at Camphill for a long time.
Bernard Thomas

DEVON & SOMERSET (North Hill)
It is 25 years since we bought our splendid site. Then, as now, there was a healthy interest in and optimism for our sport. Our annual report and accounts have encouraged us to buy a K-21 for advanced training.

Clubhouse comforts have improved – with double-glazing and Caroline's catering concession.

Although the launch rate is similar to 1990, overall flying was significantly less, reflecting poor conditions. However, pilots still achieved Philip Morrison with his first solo/Bronze leg flight; David Cottingham's Silver distance to Wimborne and, in early October, Ian Mitchell's exploration of Quantock wave.

Ron Johns and Malcolm Chant have progressed from a K-18 *via* Pegasus to Nimbus 2. For the May Day weekend, May 2-4, we will be welcoming Vintage GC members for a short rally as company for our T-21 and Eagle.
I.D.K.

DORSET (Old Sarum)
After writing that we had a roof on the clubhouse in the last issue, I now have to report a K-13 on a roof. This was the result of a launch incident but fortunately both pilots escaped with minor injuries and are flying again. We have taken this opportunity to upgrade the club fleet replacing the K-13 with a Grob.

A partially sighted couple enjoyed air experience flights and raised several hundred pounds for the Guide Dogs for the Blind.
E.B.

DUKERIES (Gamston Airport)
Congratulations to David Britt and David Robinson on going solo. The K-7 wings and tailplane are being re-covered.
J.C.P.

EAST SUSSEX (Ringmer)
Congratulations to B. Fielder and P. Staplehurst (Silver badges); B. Berger, P. Drew-Bear, C. Pembrey and D. Shepherd (Bronze badges) and to G. Clifton, P.J.Davey, K. Furmedge, B.Gent, A. Lyth, P. Martin, J. Shirvell and S. Southam (going solo). At one point five went solo in five days, occasioning a visit from the local press.

Our thanks to Henry Weston and crew for continuing improvements to the buildings and to Trentham DeLeliva for work on the field.
L.M.

ENSTONE EAGLES (Enstone Airfield)
We have 36 provisional bookings for our Regionals. The planned move to winch launching, replacing the cars, has been boosted by the acquisition of a twin drum winch.

We hope to soon have comprehensive facilities for disabled pilots and our plans have attracted attention from the right quarters.

Our annual dinner-dance was well attended with awards going to Dennis Wright, Rachel Carter, Eric Giles, Steve Veness, Larry Griffiths, Francis Whiteley, Tony Cox, Paul Murphy and Roddy Maddocks. Congratulations to them all and to Pete Green on going solo.
M.S.

FOUR COUNTIES (RAF Syerston)
Ben Beniston has resigned as CFI to become DCFI and Leigh Hood has taken over from Steve Lawes as secretary. Launches are up by 28% and hours by 22%. Congratulations to D. Palmer, S. Hall, O. Garity, J. Wilton and R. Davies on gaining awards at the AGM.

Well done to chief soup dragon Sylvia Bateman on her Silver badge.
S.D.

GLYNDWR (Denbigh)
Congratulations to Al Stokes and Noel Humphrys (going solo) and to Nigel Jennings (Diamond height). We have had some excellent ridge and wave soaring with visitors getting Silver heights and durations.

A new hardcore area is making launching easier in the wetter periods. Our hangar and workshop extension should be completed soon thanks to members' help.
G.H.

KENT (Challock)
About 20 members and eight gliders went to Aboyne with Gold heights for Joe Janzo, Pik and "Nobby" Clark. Two weeks later Caroline Bunyan gained Diamond height.

Our annual dinner-dance was well supported. Most of the awards went to John Hoye with Christine Bell winning the ladies' vase.

The Oly 2B is being re-covered by its syndicate. Congratulations to John Payne on his AEI rating.
D.J.C.

LONDON (Dunstable)
Since our last report Liz Veysey has become our manager. For a short while we had two National Champions, Robin May in the Open and Warren Kay in the Standard Class.

We have added a further two-seater and single-seater to our fleet, refurbished the tug fleet and reinstated our M3 approval. Task setting, ladder scoring and flight logging have been computerised; we have radio fax and satellite receiving equipment which produce good forecasts and TP photographs can be scanned electronically and displayed on a TV screen making assessment easier and more accurate. We also have updated photos and maps of standard BGA TPs (see the last issue, p308).

The last months of 1991 have been the busiest on record with successful expeditions to Shobdon, Talgarth and Aboyne. We have based a two-seater at Glyndwr for the winter; are running five soaring weeks this coming season to which all are welcome and are hosting a fair chunk of BGA activities.

Congratulations to Chris Pullen on becoming a BGA senior regional examiner for Thames Valley.
D.S.

MARCHINGTON (Marchington Airfield)
The dinner-dance was revived in December after a break of seven years and was a great success. Paul Shelton scooped most of the trophies with others going to Phil Pritchard and Ken Lawrence.

Grahame Taylor flew 5hrs for his Silver badge during our Portmoak expedition in October.

The winch, with new cable and a weak link system, has been well used during marginal winter days.
A.R.

MIDLAND (Long Mynd)
We are delighted with the excellent launches given by our new single drum winch (called Skylaunch), built by Dennis Jones and Mike Groves of D & M Engineering.

Despite poor weather for the annual trip to Aboyne in October, Nick Heriz-Smith and Julian Fack flew Diamond heights and Ken Screen and Alan Briscoe Gold heights.

During the season Dave Cole, Nick Heriz-Smith, Tom Jurdison, John Parry, Derek Platt, Graham Underwood and Bob Williams have achieved AEI ratings. Guy Hartland has his Silver badge and Glen Johnson, Richard Coglan and John Collins have soloed.

Jenny and Billy Edmiston are giving up the catering at the end of the year after feeding us since 1984. We wish them well.
A.R.E.

MENDIP (Halesland)
Congratulations to Nick Alcock on going solo and to Steve Collins on his 5hrs. Bob Merritt, our new safety officer, arranged a well attended lecture by the CAA on flight safety, and Peter Turner, CFI, is planning a wave expedition to Aboyne in March.
T.A.D.H.

NENE VALLEY (RAF Upwood)
Our November expedition to the Long Mynd was very enjoyable, thanks to Midland GC's hospitality.

The committee were re-elected at the AGM and chairman Roger Emms and CFI Horace Bryant outlined plans for more soaring and cross-country flying in 1992 and a proper task week.

Congratulations to Jose Mora, Dave Hubbard, Les Ward, Tony Gardener and Joe Southworth (going solo); Craig Gorowsky (Bronze badge); Nigel Perry (AEI rating); Roger Morrisroe (100km) and Gus Pinkerton (Diamond goal in France).
D.H.

NEWARK & NOTTS (Winthorpe)
Our annual dinner-dance and prize-giving, ably organised by Kevin Clayton and John Maddison, brought a good season to a close. Congratulations to Dave Parker on his AEI rating.

We have acquired a large field in front of the clubroom which has been grassed and should improve our flying facilities. We will overhaul our winching equipment to improve its already high standard during the annual four week shutdown.
M.A.

NORFOLK (Tibenham Airfield)
We are again hosting the Eastern Regionals and entries are invited.

Our new Supacat winch is giving very impressive launches and rapidly becoming an integral part of our operation.
R.J.H.

NORTHUMBRIA (Currock Hill)
Gary Oldfield, who completed his Silver badge with a distance flight to Sutton Bank and a height gain at Portmoak, joins Steve Fairley and Colin Saxton on an AEI course. John Pickering gained Silver height and 5hrs, John Collinson 5hrs at Portmoak and Martin Arrowsmith Silver height in wave at Currock Hill.

Tom Corriban has installed a comprehensive burglar alarm after a spate of break-ins.

We are hosting a BGA instructors' course and hope to organise a cross-country task week. If any club in the area is interested in joining us in organising an Inter-Club League, please contact our chairman, John Graham.
R.D.

NORTH WALES (Bryn Gwyn Bach)
We have had an extremely successful year at Bryn Gwyn Bach with too many achievements to mention but ranging from first solo to Silver and a new AEI. Congratulations to them all.

We have a new hangar and the field has been lengthened by 1100 yards.

At our annual dinner-dance in November awards went to Vic Pendleton (our farmer landlord), Dave Jones, Dave Foster, Keith Lewis, Ken Payne and John Perrin.
D.J.

OXFORD (Weston on the Green)
At our AGM in November John Hanlon took over as chairman. John Gibbons was elected vice-president in recognition of almost 40 years' service to the club.

Trophies went to Chris Emson, Mick Moxon (two), Martin Cooper, Donal Meeham, Martin Hastings and John Gibbons, John being awarded a new trophy presented by CFI Steve Evans for outstanding instruction work.

Our congratulations also to Mike O'Neill, Kevin Duthie and Simon Hogg (going solo) and Dick Carter and Colin Baines (re-soloing).
F.B.

PEGASUS (RAF Gütersloh)
Ron Turley has taken over as chairman from Bob Marston. Bob, like Ron, was new to gliding when he became chairman but worked hard for us, becoming an assistant Cat and organising the local REs to build us a MT hangar as a training exercise. We wish him and his family well in their new posting.

Several families fly with us. Russ and Hilary Wide progressed to the Astir together and are competing fiercely to get their Silver badges.

We had an enjoyable expedition to Innsbruck in October with memorable mountain flights. A Discus is on order.
D.R.M.

PORTSMOUTH NAVAL (Lee on Solent)
Nigel Gilkes, Bill Roebuck and Mick Budgen have Silver badges and Yvonne Clark her 100km diploma.

An expedition to Aboyne in October organised by Martin Heneghan gave Keith Walton, Yvonne Clark, Tom Edwards and Peter Brown Gold height and Diamond heights for Nigel Clark, Derren Francis, Phil Moore and Alan Clark, Alan for Gold badge. Our thanks to Deeside and to the RAFGSA Centre for their help and hospitality throughout the season.
K.S.

RATTLESDEN (Rattlesden Airfield)
Steve Wright and Dave King joined our instructors during a rewarding time with Paul Jewby, Des Granger and Brian King going solo and Richard Goodchild resoloing. We have a large number of *ab-initios* and are going from strength to strength.

Under the professional leadership of Peter Neeves and with a band of helpers, the hangar floor is being concreted.
M.E.

SCOTTISH GLIDING UNION (Portmoak)
At our very enjoyable end of season dinner, awards went to John Galloway, Brian Scougall (winning both club ladders), Dick Middleton, Richard Allcoat, Colin Hamilton, David Macfarlane, Graham Smith and "Z" Goudie. Congratulations to them all and to Ken Moffat (going solo) and Paul Copland (AEI rating).

We had a relatively disappointing autumn but a few Gold height days coincided with weekends. We are active seven days a week throughout the winter, have oxygen on site and a full range of courses for 1992.
M.J.R.

STRUBBY (Strubby Airfield)
With the Bocian being refurbished the enclosed cockpit T-21 is bearing the brunt of the two-seater flying. Our new twin drum cable laying winch is giving launches of unheard of power – many thanks to those who built it.

Many members had their first taste of glass ➡

on the Puchacz demonstrator during our June flying week.
R.G.S.

TWO RIVERS (RAF Laarbruch)
Our AGM was a great success – our thanks to visitors from clubs in Germany, Holland and the UK for their support. During the subsequent party the new bar was declared open. Well done to Mick and Lyn Ferguson, Richard Lovegrove and helpers who worked so hard to finish it in time.

Ian Smith has handed over as CFI to Mike Foreman. Our thanks to Ian for all his efforts.

Congratulations to Yvonne Hill on her Bronze badge. We are hosting the RAFGSA AGM at Laarbruch in January and hope to have a tug as well as our winch and a demonstrator aircraft from one of the German manufacturers.
L.F.

VALE OF WHITE HORSE (Swindon)
Congratulations to Suzie Sellman, Mike Rouse and Peter Godsell on going solo, Peter on his 16th birthday; also to Stuart Thackray for his 500km.

Dianne Steele is our new chairman. The bank tells us 1991 was a good year.
G.J.W.

VECTIS (Sandown Airport, Isle of Wight)
The season's weather was the worst yet for soaring but training has continued. Congratulations to Martin Parsons on going solo.

Our annual expedition to France gave two weeks of soaring in blue thermals, yielding Bronze badges for Matt Colebrook and Graham Griffiths; Silver heights and durations for John Leonard and Chris Bacon and a Silver badge for Jim Britton.

Roy Tiley has his AEI rating and Jenny Stewart achieved Gold height during an otherwise poor week at Aboyne in October.
P.T.

VINTAGE GLIDER CLUB
Last season every rally, except for the one at Haddenham to celebrate the 50th anniversary of the Glider Pilot Regiment, had bad weather. Three Kite 1s took part at Haddenham, the one from the Army's Air Museum at Middle Wallop in wartime camouflage.

But the season was good for restorations. During the last 18 months the new Hols der Teufel, new H-17A, Kite 1, two Swedish JS Weihes, Grunau Baby 3 and a new BAC-7 have flown while the new Gull 3 is almost ready. The Scud 2 has also flown again after restoration by Mike Beach.

Yet another "new" wave is being worked on – a second H-17; a Dagling; Peter Underwood, his son and LGC helpers are busy with another Grunau Baby 2B and the Dunstable Minimoa while Mike Birch is restoring his 1947 Czech Krajanek.

Congratulations to Ian Smith (Olympia 463) and Richard Moyse (prototype Sky) on flying declared 305km triangles from Lasham and to Keith Nurcombe on his flight from Husbands Bosworth to Cromer in the T-21 and two 100km

Philip Harris of the British Forces Germany Gliding Centre who soloed at 14. He is with his instructor, Hein Köster, who was taught to glide by Philip's father.

triangles in the Tutor, the last in 2hrs 19min with only 13min from the last TP. Also to Mike Birch who flew a 100km triangle from Booker in 1hr 30min with Lynn Stainer in his restored Condor 4.

Obituary – Thoby Fisher
We are very sad to report the death of Thoby Fisher through cancer in June. He was Philip Wills' brother-in-law.

Born in 1917, he studied aeronautics and in 1935 was largely responsible for the design of the Kite 1 at Slingsby Sailplanes. Fred Slingsby said that he was "clever, very, very clever." He gained his A certificate in 1935, accompanied the British team to the first World Gliding Championships at the Wasserkuppe in 1937 and contributed towards the design of the Gull 2.

He had a distinguished aeronautical career at Boscombe Down experimental establishment during the war and gained his Silver badge in 1949 in an Olympia. He later owned a Kite 2 which he modified to give it safer low speed characteristics and helped in the redesign, modification and stressing of the 1936 King Kite built by David Jones.

Finally, thinking his Meise wasn't exciting enough, he decided to convert an Olympia into an ornithopter as a last exercise for his design and engineering abilities. The energy required to produce the flapping and pushing back motion of the wings was to be produced by the release of a torsion bar which had been twisted by a two-stroke engine. This project of considerable complication was almost finished at the time of his death.

We shall miss a most colourful character of immense generosity and kindness who took part in many of our rallies. Our sincere sympathies go to his wife Jo.
Chris Wills

WREKIN (RAF Cosford)
Brian McKenzie and Ian Cramman have Bronze badges, Silver heights and durations. Iwen Harvey-Jones and Brian Longman have gone solo. Mick Boydon, Dave Gordon and Richie Toon flew in competitions last season.

A spin-off of our 25th anniversary party was a Cosford reunion week when many ex members flew and requested we re-stage the week this year. Our thanks to Dave Judd and Rob Ruscoe, the organisers.

We are very sad at the death of Jerry Odell and send our deepest sympathy to Tizzie and Julian. (See the obituary in the last issue, p323.) Although he hadn't been with us very long his technical innovations and charming personality gained him many friends.
R.P.

YORK GLIDING CENTRE (Rufforth Airfield)
The annual dinner-dance was also our 30th anniversary celebration with trophies going to Tom Stoker (two), Brian Pritchard, Jack Clarke and Tony Simms.

Congratulations to John Parkinson and Martin

Below: Ric Cole of Clevelands GC with his father Dick (CFI), who sent him solo.

Wilson (going solo) and Chris Braine (Bronze badge).

We have bought a Venture for SLMG PPL training – approaches from SLMG instructors with either full or restricted ratings would be welcome.

A.P.

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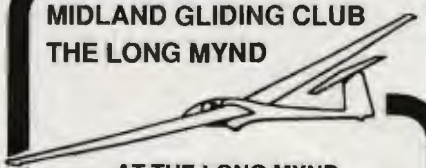

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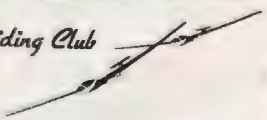

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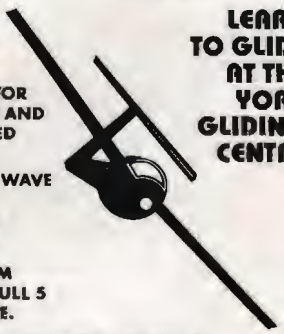

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WIRE LAUNCHING

A preview chapter from the BGA Instructors' Manual

For the last three years a small working party has been working on the definitive official BGA Instructors' Manual. This is not, as might be suspected, a simple update of the existing instructor course notes but a comprehensive reference work designed primarily for the qualified instructor.

The objective is to encourage greater thoroughness and to make available to all instructors a compendium of distilled experience which it all too often takes a lifetime to accumulate.

Bernie Morris has been the prime mover behind the project, which stemmed from his dynamic period as chairman of the BGA Instructors' Committee. The actual drafting of the book has mostly been performed by Bernie and Mike Cuming, with significant inputs from George Metcalfe and Bill Scull and from the RAFGSA – largely in the shapes of Barrie Elliott and Mick Boyden.

The entire Instructors' Committee has proof read and debated the contents prior to rewriting, re-proof reading and then repeating the process. No wonder it has taken so long; some chapters have been round this loop three or four times.

The result? A book – to be published later this year. This chapter has been published in its entirity so that instructors can have a sneak preview of the style and format of what's coming. The wire launch chapter seemed a pressing one since this department seems lately to have had a poor safety record.

Wire launch training is often introduced too early in the training programme despite the fact that launching is seldom an obstacle to going solo. It will often be more productive for the instructor to continue to carry out the launches himself in order to maximise air time and hence the trainee's handling abilities. (Each 200ft of extra launch height adds more than a minute to the flight time in unsoarable conditions.)

The pre-requisites for successful wire launch training are the trainee's ability to perceive and control pitch attitude and bank angle with reasonable co-ordination skill. Since emphasis will be placed on smooth progressive control inputs, the trainee must also be reasonably confident and use the controls smoothly.

The briefing and flying exercises are divided into three sections – in order of teaching these are :-

- General briefing and The Full Climb and Releasing.
- Ground Run, Take-Off and Initial Climb.
- Launch Failures and Emergencies.

Formal launch failure training and practice is not appropriate until approach control, reference point and circuit planning have been taught.

The piloting technique for wire launches is determined by:
The power of the launch equipment.
The rate at which the glider can be accelerated from rest to a safe launch speed.
The method of power transfer from the engine to the wire.
The type of "wire" in use.
The gliders' maximum permitted wire launch speed.
The type of weak link in use.
The type of launch equipment *eg* winch, autotow, reverse pulley.
The restrictions of specific sites.
The position of the tow hook on the glider.
The guidance in this chapter will have to be used selectively for the equipment, gliders and site at which the training is taking place.

BRIEFING POINTS
General briefing

Wire launching is achieved with a wide spectrum of different types of equipment, eg high, medium and low power winches, normal and reverse pulley autotow.

The piloting technique depends on the type and characteristics of the launch equipment the glider and the site considerations so what is taught at one site is not necessarily appropriate to others.

Pre-flight preparation

Due to the rapid accelerations during the launch it is essential that:
Any padding behind the pilot cannot compress and allow him to move back and limit forward stick movement. Parachutes are fine but some cushions are not firm enough.
Shoulder straps are tight enough to prevent the pilot sliding up the seat back.
TRIM – set forward of neutral as for approach.
WEAK LINK – ensure that the correct one for the glider is being offered.
HOOK – ensure the cable is attatched to the correct glider hook.
Consider the minimum speed for allowing the glider to pitch up.
Consider the safe speed for "pulling hard" in the climb.
Consider launch failures at various heights and the options available.
Estimate the cloudbase and do not launch into cloud.

Delays

Delays after the wire has been attached are potentially hazardous and pilots should always be prepared to release the cable if uncertainty exists.

The Full Climb and Release

The wings have to do extra work to oppose the pull of the cable and enable the glider to climb, because of which the stalling speed of the glider can increase by more than 30%.

On high power launch equipment, too steep an attitude will either cause the glider to stall and possibly flick into a spin or break the weak link depending on the glider's speed at the time.

On low power launch equipment, too steep an attitude can slow down or stall the engine or stall the glider.

The optimum full climb attitude is a compromise between being sufficiently steep to obtain a high launch and not so steep as to stall/spin, break the weak link or stall the engine.

Judging the best attitude for the full climb is different to free flight because you can't see the horizon above the nose. The position it cuts either side of the canopy becomes the reference. The angle which the wings make with the horizon is a reliable indicator which can be used on any glider type.

As the glider gains height in the full climb, more up-elevator is needed to counteract the downwards pull of the cable. This is achieved with a gradually increasing back pressure on the stick to try to maintain the climb attitude.

As the top of the launch is approached, the downward pull from the cable gradually pulls the nose down and the attitude reduces. This requires a relaxation of the backward pressure on the stick, especially if the glider starts to "buck" or "hunt" in pitch.

The top of the launch may be recognised by one or more of the following:

- The gliders' position relative to ground features (no launch failure).
- The nose of the glider being pulled down by the wire
- A reduction in noise from the winch through the cable and/or airspeed when the launch driver cuts the power.
- The rings back release due to the drag of the cable/drogue chute.
- Lower the nose sufficiently to reduce the tension in the cable and pull the release twice.

The launch involves teamwork between the pilot and the winch driver, and sloppy flying or signalling may mislead the driver. For example, the procedure in the event of low speed is to lower the nose which the driver will "see" and apply more power. It is therefore important that the glider does pull up if the speed is sufficient – or the launch will become too fast when the winch driver adds power as he should.

In the event that speed starts to drop, a relaxation of the back-pressure may be enough to cause the launch driver to add more power or allow a low power unit to increase its speed.

If the speed continues to drop then be pre-

pared to treat it as a launch failure. Always be prepared to abandon the launch altogether.

The old-fashioned "too slow" signal of rocking the wings was abandoned years ago: it is far too dangerous to be low and slow and make control movements that might induce a spin!

There is a placarded maximum speed for the wire launch to protect the structure from damage due to the cable forces. The glider is vulnerable to overstressing when above the winch launch placard speed and there are no sensations which enable the pilot to accurately judge the loads being experienced by the glider. The risk of overstressing the glider is greater towards the top of the launch where the cable angle to the glider is greatest.

Increasing speed may be due to a failure to climb at a sufficiently steep angle and a check of the glider's attitude will confirm whether the correct action is to pull back on the stick to steepen the attitude or signal too fast.

If the glider's speed is increasing towards the placarded winch speed then "too fast" may be signalled by wagging the tail a couple of times with moderate, deliberate rudder inputs. Slow – or gross – wags may just look like sloppy flying (beware the secondary effects of rudder rocking the wings). Winch drivers ought to react quite quickly to this signal since they are looking only at the glider and should not fail to spot a clear signal.

While signalling too fast it is recommended to reduce the back pressure on the stick because it:

- Reduces the stress on the glider from the cable
- Reduces the likelihood of a cable break or back-release.
- Reduces the possibility of a high speed stall and flick roll.

Too fast signals should be executed with due care if the placarded winch speed appears likely to be exceeded. If it is judged that there is insufficient time to signal or that the the speed is likely to exceed the placarded speed by a significant margin before remedial acton is completed then:

- During the early part of the launch (when the risk of overstressing the glider is low but the risk associated with abandoning the launch is high) continue the launch to a safer height but being very careful of the loads you apply to the glider with the elevator.
- During the higher part of the launch – abandon the launch.

When abandoning the launch due to excess speed pull the release twice with the cable under tension (to reduce the chance of the glider colliding with the cable, parachute or stop assembly) or

Crosswinds. It is unusual for all launches to be into wind.

The maximum height will be gained by keeping the wings level and allowing the glider to drift, but at some sites this will cause the wire to drop on to no go areas. In this case, the upwind wing is held slightly low using the controls in a co-ordinated manner: this will carry the cable to the upwind side and prevent it from drifting too far downwind. NB. The glider is not sideslipping.

Ground run

The ground run phase may be quite protracted with low acceleration launch units, particularly on light wind days, or breathtakingly short with high power launch units.

The ground run is distinct from the other phases of the launch because the co-ordination of the controls is different.

The rudder is used to steer the glider, the ailerons to keep the wings level and the elevator to balance the glider on its mainwheel.

Steering with the rudder may cause a wing to go down – be ready.

At low speeds, relatively large control inputs may be needed, but these will reduce as the controls become more effective when the speed increases.

It is essential to be able to release the cable immediately if necessary (*eg* during an over-run) in this stage of the launch. Always keep the left hand near the release knob (but not actually holding it).

Crosswinds – The chances of having to abandon the launch are increased due to the possibility of:

- Weathercocking about the wheel causing loss of control which may lead to a groundloop.
- The into-wind wing lifting before there is sufficient aileron control to prevent it – again causing loss of directional control and possibly a groundloop.

Apply some downwind rudder before the glider starts moving to anticipate the weathercock tendency (prevention is better than cure!)

Take-off and initial climb

This is a transition stage where speeds, heights and attitudes are critical if safe margins are to be maintained whilst getting the most from the launch.

This phase may be quite protracted or very brief depending on the acceleration available from the launch unit.

The glider will lift off naturally from the ground run at which point the independent use of the controls must cease.

The combination of the "feeling of acceleration", indicated airspeed and its rate of increase determines how much the glider may be safely pitched up at any height during the initial climb.

Many gliders require a forward pressure on the stick to prevent the nose pitching up too far during the initial climb. This effect is more pronounced in gliders with aft hooks. Few types require a positive back pressure to climb initially.

The glider must be controlled so that, its speed, height and attitude are such that it is possible to achieve a safe round out in the event of a launch failure.

The safe speed for allowing the glider to pitch up depends on:

- Glider type – its inertia and stalling speed.
- Turbulence – a lull can cause an instantaneous speed loss.
- Wind gradient – causes a speed increase with height which is lost again when descending.
- Rain – raises the stall speed and reduces visibility – don't launch.

Once the speed is accelerating through the safe speed the glider can be climbed with the attitude gradually increasing towards the full climb attitude.

Satisfactory wire launches will include a noticeable "feeling of acceleration" both before and after take-off, and this may be particularly marked with high power launch units. Any absence of, or interruption to, this acceleration indicates a problem.

Notice that this feeling can also be produced simply by pitching up the glider irrespective of airspeed and by itself is not a complete indication of "safe" conditions for the full climb.

The need for constant awareness of the "feeling of acceleration", the airspeed and attitude during this phase cannot be over-emphasised. ➡

Launch failures

The objective is to land safely after any launch failure and there is a sequence of events to achieve this:

- Recover to a safe attitude whilst checking the airspeed.
- Release the wire.
- Check airspeed.
- Regain approach speed.
- Judge the situation.
- Plan a safe approach and landing.
- Fly the approach and landing or a circuit variation to it.

A cable break is usually easily recognised by the lurch and twang which normally accompany it, although it is less obvious if the break is at the winch end. The failure of the launch engine can be much more insidious particularly if it is gradual.

The Recovery

The variation in the extent of "recovery" is from level (at low level) to the fully-developed climb – possibly 50° nose up. The required amount and rate of control movement is comparable with the possible range of movement in stall recovery from relaxing the backward pressure to a very positive forward movement. As with stalling over-controlling can produce reduced *g* and/or excessive loss of height.

The indicated speed during the "recovery" also provides a guide to the rate and amount that the nose must be lowered.

Except when very close to the ground the stick must be moved forward to achieve an attitude lower than the approach attitude, to achieve approach speed quickly, bearing in mind that descent through the wind gradient will delay the acceleration.

Any delay in lowering the nose from a steep climbing attitude will very quickly bring the glider close to the stall or may cause it to stall.

Release

When a launch failure occurs the drogue chute and a length of wire often remains attached to the glider. The drogue chute, together with the wire, must be released to eliminate the possibility of a large increase in drag or a hang up if the wire fouls an obstruction.

Pull the release knob twice to release the cable.

Regain Approach Speed

It may take some time to regain the approach speed.

Be patient and don't open the airbrakes or turn until the approach speed has been regained.

Use this time to judge your height and position and to plan the approach.

The decision may be affected by the height lost whilst gaining speed!

Planning/Judgment

The planning decisions must be dealt with systematically and a safe landing is the only objective. Expediting the retrieve must not be allowed to influence the decision.

The first consideration is "can I land ahead?" If the answer is "yes" then do so! At small or restricted airfields the decision as to whether there is enough space may be quite tricky because it is a judgment decision that seldom arises in normal training.

If landing ahead is possible then a further consideration is "do I have to land directly ahead?" meaning would a slight change of direction make more space available, *eg* taking advantage of any crosswind.

If a landing ahead is not possible then a turn to one side must be made., Which side is a pre-take off decision based on crosswind, airfield layout and terrain considerations. The turn is usually to the downwind side unless over lee slopes at hill top sites or possibly for other reasons peculiar to individual sites.

Before turning too far, *ie* with the upwind end of the airfield in view, the decision whether to turn either into wind or across the field (the dog leg) has to be reviewed. If the dog leg is not possible then the turn should be continued to make a circle.

Once a circle is started it may not be necessary to turn through 360°, there may be better choices after 270° or so.

The circle may be extended into a circuit and the decision to turn in becomes essentially the same as that for running out of height in the circuit. The final turn should normally be completed at the same height as any other final turn although at restricted sites a lower-than-normal final turn may have to be accepted.

Apart from the straight-ahead, dog-leg, circle and circuit options there are other possibilities to consider:

- The 180° Turn The difficulty with this option is to position the turn with one's back to the airfield and with any significant tailwind component leave enough space in which to land. Not to be recomended for inexperienced pilots and possibly not needed by experienced ones.
- The Off-Field Landing. At some restricted sites this possibility should not be excluded, especially when any other choice might involve a very low final turn. It might also be a choice at some hill sites.
- The S Turn is seldom appropriate even where operation is restricted to narrow strips. It is a very difficult manoeuvre and if it is badly executed it may put the glider nearer the up-wind end of the airfield higher than if a straight-ahead approach had been made using airbrakes. S turns will involve 360° or more of turning with two turn reversals probably involving more height loss than a circle and the possibility of the loss of speed or misuse of the controls.

Inadvertent Cloud Penetration

Avoid launching into cloud and release in good time.

If enveloped in cloud;

- Release under tension to avoid the flying drogue.
- Lower the nose to regain approach speed.
- If the speed increases excessively, open the airbrakes.

FLYING

The pre-flight checks should be familiar to the trainee already but include a reminder about trimming, correct weak link, correct glider hook, launch failure options and who will fly the launch failure.

Demonstrate the full climb and release followed by trainee practice.

Demonstrate the too fast signal before the trainee tries it.

When the full climb is being well handled demonstrate the ground run, take-off and initial climb before trainee practice.

On an opportunity basis take over to demonstrate launch failures.

Demonstrate and practice launch failure recoveries as an upper air exercise.

Do not simulate any launch failures, particularly low level ones, for trainee practice until they have been demonstrated.

Full climb and releasing

Judge the climb angle by the angle between the wing and the horizon.

Notice the position of the horizon in relation to the sides of the canopy.

Keep the wings level using co-ordinated aileron and rudder.

Monitor the airspeed.

Glance from side to side through the ASI occasionally to check -

- Angle of wings to horizon.
- Airspeed.
- Height above the ground and progress along the site.

More and more up elevator is usually needed to counteract the downwards pull of the cable but relax this if the glider starts to buck or hunt.

Try to anticipate the end of the launch from ground references.

Notice;

- The nose being pulled down.
- The noise and/or the speed reducing.

Lower the nose enough to take the tension off the cable and pull the cable release twice.

Adjust to normal flying speed and turn away to clear the area for the next launch.

Too fast

Check the climb attitude and if it is too shallow, increase it.

If the airspeed is approaching the wire launch maximum, but before it exceeds it.

Relax the back pressure on the stick slightly to relieve some of the cable tension.

Use rudder to yaw the glider once to each side preventing rolling with the ailerons.

Gently raise the nose to the climbing attitude again, checking the airspeed.

If the speed significantly exceeds the wire launch placard speed, reduce the back stick and abandon the launch when high enough to do so safely.

Airspeed low in the full climb

Airspeed is low.

Lower the nose to avoid further speed loss and . . .

- If the speed increases to the minimum safe speed smoothly raise the nose to the climbing attitude.
- If airspeed does not increase treat this as a launch failure (don't hang on too long as the landing area ahead is decreasing.)

Ground run, take-off and initial climb

When the cable is tight, call "all out".
Keep the wings level with the ailerons.
Balance on the main wheel with elevator.
Steer straight with rudder.
If a wing goes down, release.
As soon as it has flying speed, the glider will take itself off.
Feel the acceleration and notice the airspeed.
Smoothly and progressively raise the nose.
Check speed regularly.
Gradually steepen the climb until, at about this height, the full climb attitude is reached.

Launch failures

Launch failure training should really be the province of only the most experienced and in practice instructors.
Initially demonstrate and practice launch failures as an upper air exercise.
Launch failures at different heights must be demonstrated prior to being practiced by the trainee but start with the high ones first.
Both simulated cable breaks and winch engine failures need to be taught.
Consider the minimum safe speed and height combination for launch and launch failure options before every launch.

Upper air – exercise; launch failure in the full climb

Describe a wire launch failure scenario occurring during the full climb.
Dive the glider to about 60kts.
Pull up into a 50° nose up attitude.
Immediatly assume that the launch has failed.
Lower the nose to below the approach attitude.
Pull the release twice.
Check airspeed.
Don't turn or open the airbrakes until approach speed attained.

Upper air – exercise; spin off a normal gliding attitude following a cable break

HASSLL check.
Describe a wire launch failure scenario in which, although the nose is lowered after the failure, a turn is commenced before the glider has had time to accelerate to a safe speed.
Increase speed to 60kt then raise the nose to a wire launch attitude.
Maintain this attitude until the glider is close to the stall.
Positively lower the nose to the normal glide attitude and immediately this attitude is reached commence a co-ordinated turn.
Bring the stick back to maintain the normal gliding attitude.
The aircraft instantly stalls and a wing may drop if the controls remain deflected as for the intended turn.
Allow the spin to develop if possible.
Recover or hand over control and command recovery – stall, spiral dive or spin recovery as appropriate.
Establish how much height has been lost and relate this to a low level cable break and any wind gradient delaying acceleration to a safe speed.
Emphasise that attitude itself does not necessarily indicate adequate speed. Although the nose was lowered as the aircraft approached the stall, insufficient time was allowed for the aircraft to regain flying speed.

Launch failures

Unless close to the ground lower the nose to below the approach attitude and pull the release twice.
Check airspeed.
Can a landing straight ahead be made?
Check airspeed again.
If a landing ahead is not possible then decide alternatives.
Don't turn or open airbrakes until approach speed attained.

DEBRIEFING

Placarded maximum wire launch speed.
Minimum safe wire launch speed.
Too slow.
Too fast.
Initial climb considerations.
Stall speed on wire launch.
Launch failure procedure near the ground.
Launch failures from different heights.
The need to allow time for the speed to increase to approach speed before manouvring and/or opening airbrakes.
Appreciation that different gliders, launch equipment and sites may require different techniques.

ADVICE TO INSTRUCTORS

Hand Positions

You need to be extremely alert and ready to take over – especially during the take-off, intial climb and following a genuine and unexpected cable break.
Right hand hovering behind the stick during take-off and initial climb ready to take over if the glider is allowed to climb too steeply.
Left hand behind airbrakes too prevent them opening either inadvertently or deliberately at the wrong time.
Right hand ready to prevent any or too much forward stick during low level launch failure.

Launch Equipment

Modern wire launch systems use a powerful winch or car, using strong cable in good condition together with appropriate weak links. Such a launch system should easily be capable of getting a K-7, K-13, K-21, Blanik, Puchacz or Bocian to 1000ft from an 800 yard run in still air: 1000 yards should give 1300ft; 1200 yards should give 1600ft and each extra 100 yards should add a further 150ft in still air. Add 50% to these figures for a 15kt headwind component.
Regular cable breaks indicate that replacement is required and a good launch system should not suffer actual failures at all when the cable is new and less than 1% later. The use of piano wire or other specific site considerations may of course have a substantial effect on this, or indeed on the height attainable.
Piano wire tends to coil and releasing it under tension should be avoided at the top of the launch if possible.
The other remaining variable is the method of torque control on the winch. Almost all the really powerful (180-plus horsepower) winches have automatic gearboxes and smooth hydraulic torque converters – which effectively act as a weak link in the system. There are, however, still winches with manual gearboxes and also some under-powered winches in service. Some high powered winches only achieve moderate rates of acceleration.
It is thus essential to know the relative performance of the launch system in use at your club and to adapt your teaching methods accordingly.
The increasing use of heavier glass-fibre gliders adds several new factors, compared with the older generation of machines.

- Slower acceleration to "safe" speed.
- Higher stall speed, giving less margin for error.
- Higher maximum permissible launch speeds – giving more time to react.
- Greater inertia, helping – in part – to conserve speed during a cable break "pushover", but delaying speed recovery when slow.
- Higher flying speeds increase the radius of turns with impaired ability to make S turns compared with older gliders

The extent to which the launch profile can be controlled by prompting is limited and critical near the ground. Rotating too soon or with insufficient speed is particularly fraught. You should be prepared to take control to safeguard a potentially hazardous situation and to hand back control to the trainee once the situation is safe. If you take over instantly in the event of an unacceptably rapid pitch up then you will not only safeguard the situation but also bring the right emphasis to the trainee. If your hand is hovering behind the stick such as to prevent too much "back stick" then the take over of control will come naturally.
Since the airspeed during the launch does not depend solely on the glider's attitude, frequent monitoring of the ASI needs to be established.
The maximum tolerable crosswind component depends on the glider type. In general, gliders which rest tail down (when the pilot is in the cockpit) and have tailskids, are more susceptible to crosswinds. For these types (*eg* K-6, most glass gliders) it is usual for the downwind wing to be held at the beginning of the ground run – to reduce the risk of weathercocking.

Low power winches

The main differences in technique between a low power winch launch and a high power launch are in the ground run/take-off and initial climb phase and also the need to avoid stalling the winch engine through too vigorous a climb.
With a low power winch the initial acceleration will obviously be more gentle. This means that the ground run will take longer, the controls will be that much slower to become effective, and more ground will be covered before a safe take- off speed is achieved.
After the glider has become airborne, the build up of airspeed will be more gradual, and great care is necessary not to rotate too suddenly into the full climb. It remains important to monitor the height, attitude and airspeed during the progres- ➡

sive rotation in order to ensure that in the event of a launch failure at any given moment a safe recovery and landing can be achieved.

With an underpowered winch, a power failure at low level can be particularly hazardous. This is because the associated reduction in acceleration is more difficult to detect and the pilot may be tempted to "hang on" for a few seconds longer in the hope that power will be restored. For this reason special vigilance is necessary during the take-off and initial climb. Any loss of power must be countered immediately by lowering the nose (assuming enough height has been gained) and aborting the launch.

After the initial climb the launch can be handled in a similar way to the "high powered" situation except that -

In certain conditions there may not be enough power – even at full throttle – to maintain a satisfactory speed and climb rate throughout the launch.

The height achieved and the rate of climb will be less. The decisions in the event of a launch failure, particularly at a restricted site can therefore be more critical – there may be genuinely only one "correct" decision.

Less height means less time for instruction so pre-flight planning and briefing is that much more important.

Autotow and Reverse Pulley Autotow

Similar considerations apply as to the low powered winch. In addition some autotow vehicles, with automatic gears, have the annoying habit of changing gear just after the glider has become airborne. This results in a momentary loss of power at typically 10 to 15ft which clearly can be most disconcerting if not anticipated. Habitually accepting this can mask a launch failure on other equipment.

Hunting in pitch near the top of the launch is more common on autoow operations and may be due to the natural frequency of oscillation of the constant length cable. Relax the back pressure on the stick to allow the oscillation to die out.

On reverse pulley operations the driver may not see when the glider is approaching the top of the launch overhead the pulley and therefore not slow down. Pilots must be aware of the rate of climb of the glider and release when it drops off to avoid dropping the wire on to the pulley.

Preparation for Flight

Trim is conventionally set for the approach to cater for the possibility of a launch failure. However, this may require an excessively high stick force during the full climb.

Loose articles may fly around the cockpit on initial acceleration and during the climb or a cable break. It should go without saying that loose articles should be properly stowed before take-off.

Launch failures

It may be possible with a particular launch system to pull up directly into the full climb with ample speed on almost every occasion. This practice is potentially dangerous because - This habit may prevail even on those occasions when the speed is not ample.

Human reaction time may be slower than in a simpler situation.

The programme of training may be dictated by the state of the cable; tatty cables ensure enough practice but not necessarily at the right stage, good cables may mean a concentrated session of training is required just before solo, and regular refresher training later on.

There are a number of parts to the launch failure exercise – recognition, recovery, judgment, planning, execution of the approach and landing. Although the trainee may have coped with similar tasks, *eg* stall recovery, circuit planning,etc.the workload in the launch failure/cable break sequence may be too high for him or her to cope. If you are not demonstrating then be prepared to assist – prompt or demonstrate in part. Above all, do not let the situation develop until it is close to the limits of your own capability. Take over well before your limits are reached.

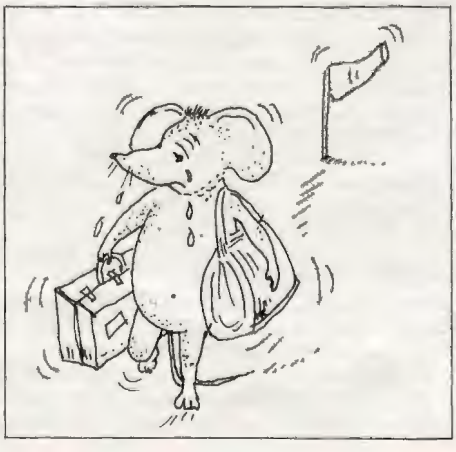
The time scale and sequence of events may face you with some critical decision making; if in doubt whether to take control or not then there is no doubt.

At difficult (*ie* restricted) sites it is appropriate for a newly qualified instructor to take control and only demonstrate the launch failure recovery, rather than allow the trainee to attempt it.

At many large airfield sites cable break options are plentiful and easy. Recognise that in principle you should be training a trainee to deal with situations at any site.

Over controlling of low level failures is a potential hazard. Consider the implications of a trainee who has only had high-level failures, he will be programmed for recoveries from a nose-up attitude and consequently, may over control a low level failure. You should guard against this.

The low level failure, even in a level attitude, is particularly fraught in a wind gradient – consider a typical training glider, *eg* an K-13, at 30ft and 45kt in a moderate wind gradient when the cable breaks. Some of the speed will have been gained (the converse of losing speed descending through it) due to the gradient, say 5kt, and this will be lost again in descending. In an actual cable break/failure any delay in lowering the nose the small amount required will result in further loss of speed and, possibly, a heavy landing or worse.



Very low level failures at 5ft to 10ft. Don't lower the nose at all. There have been several accidents due to lowering the nose into the ground.

Do not simulate a launch failure to test a trainee at a height below which any delay, over controlling or airbrake deployment would tax your ability to recover. The low level failure must be pre-briefed and demonstrated prior to any trainee attempt at the exercise. The trainees practice must also be pre-briefed with particular advice not to over control on the elevator. This exercise has produced far too many training accidents to justify surprise testing.

Plans of action following a launch failure or launch abandonment should invariably stress the need to land straight ahead if at all possible. This may even mean landing out. Low level manoeuvring, especially under stress or at low speed, continues to be the major source of all UK flying accidents.

In the marginal straight-ahead case the answer to the question "is there enough space?" has to be considered by the instructor. It is interesting that in the early stage of a land ahead the amount of space may seem marginal but usually proves to be more than sufficient.

If a trainee makes the decision to go straight ahead and it is safe to do so then it is imperative that he should be allowed to carry it out even if other options (dog leg, circle) are possible and more convenient. Only by allowing a trainee to carry out his decisions will his confidence increase.

When turning after a launch failure the circle may be extended into a circuit and the decision to turn in becomes essentially the same as that for running out of height in the circuit. The final turn should normally be completed at the same height as any other final turn but trainees might:

- Turn in early and higher than usual because they are being tested.
- Continue downwind and turn in lower than usual to reduce the retrieve (this circumstance does allow the instructor to see how well the trainee flies under what should be a higher workload), but this is to be discouraged.

Conversions

Beware of conversions from high acceleration launch systems to lower acceleration systems as they may rotate immediately into a steep climb after take-off.

Beware of conversions from autotow or weak winch to powerful winch – they probably won't pull up properly and will get much too fast.

Beware of conversions from equipment which had a noticeable gear change in the very early part of the launch. They may not recognise a low level launch failure quickly and hang on waiting for the power to pick up.

Beware of conversions from aerotow – they won't pull up at all. Also they will normally take at least ten wire launches to become competent: this may disappoint them initially!

Normally instructors will be familiar with their own launching device and in many cases will themselves have been trained using the same or similar equipment. If you are intending to instruct at a site with unfamiliar equipment, you should ensure that you can cope yourself before attempting to teach others.

COMMON DIFFICULTIES

Too abrupt or gentle a transition into the climb. This may be due to a tendency to look straight ahead rather than scanning from tip to tip via the ASI. Or it may mean that he never had a decent demonstration of what it should look like in these wind conditions. Don't be afraid to redemonstrate if prompts or descriptions don't work. This phase of the launch is over so quickly that you have no opportunity to correct the fault in flight. Each time he climbs too abruptly he is hazarding you too!

Fishtailing up the launch is usually caused by a failure to apply sufficient (or any) rudder to counteract the adverse yaw which results from making small aileron inputs. Analyse as well whether the aileron inputs are all necessary.

Incorrect rudder co-ordination in crosswind drift correction. Explain that drift correction is achieved by applying some bank with co-ordinated controls. Once banked the rudder will be centred and the glider neither slipping nor skidding.

Always end up turning upwind after release. Explain that not only must the nose be lowered but any bank for crosswind correction must be removed promptly too.

Bucking or hunting at the top of the launch. This pitch oscillation near the top of the launch seems to depend on cable length and tension but some glider types are particularly prone to it. The remedy is to lower the nose slightly – enough to stop the oscillation – and then gently raise the nose back into the climb attitude.

Releasing under tension. Especially on a winch using piano wire, this can cause time-wasting breaks and tangles. Releasing under tension does not offer any significant height gain and it increases the wear on the hook as well as unnerving the trainee.

Poor directional control, wing dropping on ground run. The most likely initial cause of this is that the trainee has not yet learned how large the control movements should be at low speeds. The problem is aggravated by the fact that the co-ordination is different on the ground because the rudder is steering the glider as well as balancing aileron drag. If the glider lifts off whilst recovering from slewing on the ground the possibility of a spin when the power increases is quite large.

Wing rocking during the climb There are two possible causes.

Rapid small-scale wing rocking is caused by being two close to the stall and the remedy is to relieve the back pressure on the stick until the wing rocking ends.

Slower large-scale wing rocking is usually caused by the trainee correcting for one wing low but failing to centralise the ailerons when the wings are level and thus dropping the other wing, *ie* overcorrecting. This may be due to:
The trainee failing to recognise wings level.
The very small amounts of aileron required at the launch speed compared with the much higher sustained elevator force.
A tense grip which may mask the stick forces being applied.

Offset wires – Sometimes the wire is dragged some distance sideways to the glider from the point where the retrieve vehicle dropped it. This can result in a substantial sideways bow in the wire even when slack has been taken up. This bow causes a vigorous swing towards the wire which cannot be prevented with the rudder and may result in a wing drop. Either:
The glider should be pointed down the wire prior to launch to avoid this swing or
The pilot must accept that this swing is inevitable and be prepared to take prompt action to keep the wings level.

OVERSEAS NEWS

Please send news and exchange copies of journals to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH, England

LILIENTHAL'S DERWITZER

In Germany, Alfred Lohmeyer has built a flying replica of Otto Lilienthal's Derwitzer, the glider in which Lilienthal carried out his first proper flight. The project took two years to complete; traditional construction methods were used. The intention was to make at least one flight from the Wasserkuppe.

DANGERS OF RADIATION

In *Soaring* magazine, a warning has appeared about the dangers of exposure to carcinogenic UV radiation at high altitude. At 20000ft, the amount of UV absorbed is more than double that at ground level. Guy Ford Byars recommends applying a film with a UV filter to the cockpit canopy. *Segelflygsport* recommends a long-sleeved shirt and a sun-hat as a minimum.

LITHUANIA COMPETING

The traditional Poitiers Two-seater Championship ("Coupe d'Europe des Planeurs Biplaces") had an entry from Lithuania. Vytantas Sabeckis and Viktoras Kukcitaitis flew their LAK 12-2R to 4th place in a field of 26, winning three days in a competition which saw ten contest days. They achieved their prominent placing despite having missed the first contest day.

UNMANNED MOTOR GLIDER

John Langford of Aurora Flight Sciences Corporation has developed an unmanned motor glider (Perseus) for exploration of the upper atmosphere. The aircraft is designed to lift 50kg of scientific equipment to an altitude of 25000m (80000ft+). It has a 16.7m wingspan and is capable of flying extremely slowly – 50km/h at low level, corresponding to 280km/h at its ceiling. A typical flight profile is a winch launch (the propeller has inadequate ground clearance for self-launching), followed by a powered climb to maximum altitude and a powered loiter of about 1hr before the fuel runs out.

Most of the Overseas News in this issue has been translated by Max Bishop from the Swedish *Segelflygsport* magazine.

A thought for February 14.

LOVE IS ...

(Apologies to Adrian Henri)

Love is hanging on in a frozen field
Love is taking weight when the wing won't yield
Love is de-rigging when your blood's congealed
Love is.

Love is seeking shade on a Provence plain
Love is retrieving over wild terraine
Love is doing it again and again
Love is.

Love is standing by when the showers fall
Love is taking off knowing you won't stall
Love is flying high, supreme over all
Love is.

Zillah

WAY OFF TRACK

Feeling shirty

I wouldn't want to be in Mary Meagher's *équipe* if she ventures to Aboyne or Portmoak in search of wave.

Not hitherto sparing in detail on the advance of her admirable flying career, Mary left things unsaid in her report on the Women's European Championships in the last *S&G*, p312. Perhaps the need for brevity in this particular report, to avoid upsetting such Booker chauvinists as Dave Watt, prevailed over her normal instinct for communication but I was intrigued by her passing reference to her dismissal from the managership of the British team.

"I was ultimately given the sack for insensitivity," she wrote, "and for leaving Scotland off the map on the commemorative T-shirts."

I had thought only moments before reading this that there was something peculiar about the British team photo and only then realised that it was the outline of an oddly truncated landmass which the ladies had emblazoned across their several frontages – save for Gill Spreckley who played safe with a blazer carrying a Union flag pocket badge.

With the Scots – and possibly even Mancunians and Tynesiders too – justifiably restive over each and every slight they receive from a government obsessed with that part of the country encompassed by or closely adjacent to the M25, and "national" media which are interested in scarcely nothing north of Islington and Camden Town, Mary will unwittingly have advanced the ultimate dissolution of the UK by another tiny notch.

One can only assume, in the lack of further detail, that Mary, unusually for an expatriate now resident in these islands for 20 years, fell victim to the virtually universal practice among her compatriots of saying "England" when they mean Britain.

So, Mary, more detail in this instance please – just like the blow-by-blow account of solo Super Cubbing to Alicante in winter, published in the December *Pilot* and of which an admiring Penguin read every word.

A nose for lift

D. L. Hadley raised an interesting possibility in the December *S&G*, p339, when he suggested that the tubular nose of the albatross might function as a "shearometer", detecting the rate of change in pitot pressure through the wind gradient over the waves, which some believe is used by albatrosses for dynamic soaring.

He isn't the first person to discuss dynamic soaring – and the albatross, of course, isn't the only bird with a directly forward-facing nasal tube.

That other remarkable wave-skimmer, the storm petrel – though less adept at gliding through its lower aspect ratio wing – has a similar hooter atop its bill. I read Mr Hadley's theories only the morning after attending a "birding" lecture in which I was told it was an efficient desalination plant which enabled the petrel to remain in the open sea for months on end, coming ashore only to breed.

The really striking thing about the hardy mariner is just how small it is. When I saw storm petrels being ringed at the Copeland Islands observatory last summer I was amazed to find that one would fit comfortably into the palm.

Just like Eliza Doolittle's "sparrer", in fact.

But to return to the possibilities of kinetic soaring: it was generous of Mr Hadley to concede that a pilot seeking to emulate the albatross "would be wise to use a glider fitted with a motor for practice."

At Bellarena the Ulster GC is perhaps the best placed UK club from which to conduct such research as at least 50 per cent of our flights are partly over the sea. Magnificent waves, sometimes with a 5000 mile Atlantic "fetch" behind them, are as often as not crashing on to our seven mile long silky smooth local beach.

But on the rare occasions any of us have chosen to fly only feet above their foaming crests we have prudently chosen a more reliable access to kinetic energy – a red-line beat-up with the certainty of being able to pull up into ridge lift on the cliffs behind the beach, or otherwise to sink, safe and dry, on to its welcoming sand.

But if Mr Hadley, or any other bold experimenter, wants to try soaring like an albatross to the general benefit of us all – please, be our guest.

Strong pong

On the subject of, literally, nosing out lift, we used to be able to do this frequently at our former site, Long Kesh.

It was only two miles downwind in north and north-easterlies from a burnhouse where the carcasses of "fallen" animals – those that have died through various unmentionable natural causes rather than having kept an appointment with the slaughterman – were rendered down to fat and bone meal.

The waste heat off the burnhouse was, indeed, often soarable and widely advertised itself. The stench was, simply, appalling.

Now the BSE scare has destroyed the market for the by-products of such animals so they are sometimes left lying where they "fell", or are otherwise dumped in woodlands, ditches or in places of public resort like golf courses and gliding sites. The wider community now gets the olfactory benefits previously enjoyed by so few.

It was always a theory of mine that Long Kesh was chosen by the government to be an internment camp as a means of wreaking its revenge on the men inside.

Breathe – and repent.

Span and tonic

Drowsily, I picked up Spenser's *Epithalamion* the other night for a spot of light bedtime reading when the intriguing words "Phoebus gins" sprung from the page. Instantly, I was fully awake.

I love both Phoebuses and gins. I owned a Phoebus once and had more troublefree and glorious cross-country soaring in those six years than at any time before or since. In umpteen field landings, many into tiny Irish pastures which spoiled GB pilots would liken to a handkerchief, it never suffered so much as a scratch.

So much for the silly horror stories about its "phoeble" airbrakes told, or written, by those who have never flown a Phoebus as much, or been caught out so often, as I.

But I'd never before associated the sublime 17c specifically with G&Ts. Least of all can I recall ever having had one thrust into my hand by a well-wisher after the aircraft were de-rigged or hangared for the night. But then my appointed role in *après-vol* drinking during my entire gliding career has been, invariably, to *buy* the drinks.

Reading the passage fully, I found that Edmund Spenser probably hadn't owned a 17c, or been a G&T fancier either, but was merely illustrating how much spelling, like technology, has moved on since he knocked off the piece, together with a syllable here and there:

The Rosy Morn long since left Tithones' bed,
All ready to her silver coche to clyme,
And Phoebus gins to shew his glorious hed.

Many a Rosy Morn in those six years I left Hen Penguin's bed, hedded to the field and clymed, if not to a silver coche, at least into a somewhat yellowing gel coated one. And then proceeded to out-clyme anyone who cared to joust in the same thermal or wave as me.

I'll buy a launch – launch, not lunch – for the first person who, encountering me on any gliding site, can immediately quote, word-perfectly, Spenser's next seven lines.

Then *they* can buy *me* a Phoebus gin.

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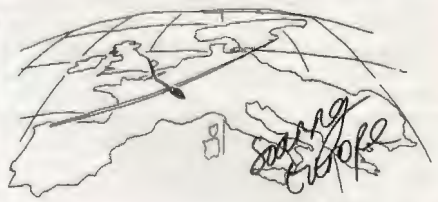

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MISCELLANEOUS

MR C EBBS. Mr Ebbs was employed by us for the 1991 season as an assistant rated instructor. During this time he was in no way involved in the management or running of the club. Surrey Hill GC Kenley

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