

wings!

Official magazine of the BHGA

6/1979

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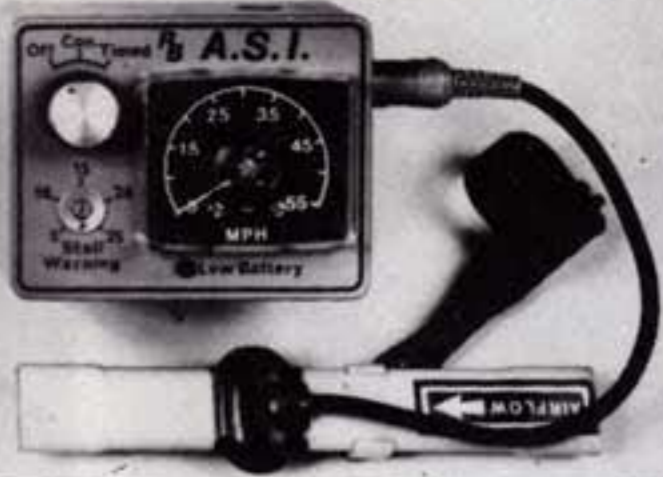
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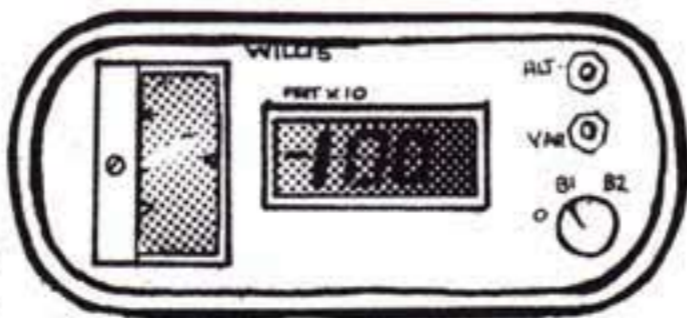
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Photo by Dr Alan Beaumont



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EDITORIAL

So, the eternal helmet chestnut has come out for a roasting again! Criticisms of Lester Cruse in Airmail No. 4 have brought several reactive letters to the columns of this issue.

I expected some response, but it was disappointing that letters missed the main point. The original issue was not whether or not helmets should be worn. Nor was it concerned with unlikely psychological delicacies, as Barry Annette would have us believe. It was quite simply based on the fact that a top flyer behaved in an irresponsible manner by encouraging a visitor to break club rules — and used flying status as a justification.

Does Tommy Thomson belong to a BHGA member club? He should know that most member clubs insist that all pilots using their sites must wear helmets. The reference to flouting of rules was no slip of the editorial tongue.

It is a fact that the fatality rate of 1978 would have been even higher if pilots involved in non-fatal accidents had not been wearing helmets. Apart from wanting to preserve life, clubs also want to preserve flying sites so that pilots can continue to enjoy flying from them. Fatal accidents can endanger even safe hang gliding sites — and more than one delicate flying site has been lost through a fatality there.

Flyers of high repute and ability are regarded with awe and admiration by newcomers to the sport. They are asked for advice, which, as in Ian Trotter's case, is usually freely and helpfully given. But their own pattern of behaviour sets an influential trend.

When a top flyer refuses to pay his club dues, or lands in the middle of the corn on a light wind day (claiming that he is out to win the League and is going to practice somewhere), then patience and tact wears very thin.

Persistent non-conformity to club rules using pilot status as a justification is the height of irresponsibility. It makes it difficult, if not impossible to explain to the intermediate pilots why they should not follow suit.

Top flyers can be a valuable asset to a club when they set a good, responsible attitude. When they don't, they create more problems and dangers to a site than a whole host of new flyers could ever do.

Rules are here to stay, and if the ones we have are persistently broken we will have even more rules imposed on us from outside. It's up to everyone to help preserve what we have got now — otherwise everyone's personal liberty in hang gliding will rapidly vanish from sight.

JEANNIE KNIGHT

WINGS EDITOR

Jeannie Knight has been appointed permanent editor of *Wings!* following a BHGA Council meeting on June 17th at which the appointment was confirmed.

RECORDS and FAI AWARD CLAIMS OFFICER

The BHGA Council have appointed me to this office to look after the Records and Awards that some of you fellows are going to acquire in the future. This job will, I'm sure, be the most interesting in the BHGA, and it is my pleasure to accept.

Over the last four weeks or so I have been reading and making use of a host of information supplied by the FAI, and the British Gliding Association. The guidelines are well set out in the FAI Sporting Code and from this document we already have a summary and this is to be found in the Observer Handbook. From all this information and with an enormous amount of expert help from Ann Welch I'm just about ready to go into business. There are in total six certificates and you will be able to get them from our Taunton office. All the certificates are in the main self-explanatory and easy to use, but like that law we know so much about, we may well have to make adjustments from time to time.

May I now wish you all the very best of luck in the future and may all your claims be big ones!

Rick Wilson

SILVER DELTA

The latest information that I have is as follows, the first 50 Silver Delta Badges will be numbered 1 to 50 and will be issued by the Federation Aeronautique Internationale from Paris. Number 1 I think has gone, but numbers 2, 3, 4, 5 and 6 are there for the taking. What an achievement it would be for them to come to Britain. We have at this time four Pilots well on their way to the Silver, and there must be one or two more of you about. If you are in the running please note the following.

Remember the paper part of your claim will be going to Paris.

It's your responsibility to get it right, two heads are better than one, make the other head that of an Observer, and refer to the Observer Handbook.

1. Make sure that you have the necessary witnesses for the distance of 50km (31.07 miles).

2. A properly sealed and officially calibrated Barograph (*see section 5 of the Observer Handbook*) for the height gain of 1000 metres (3281 feet).

3. Last of all, but the most tedious Perhaps 5 hours duration flight, with a witnessed take-off and landing.

The Certificates that you will require are to be had from the BHGA Taunton, you or your club Secretary can apply for them.

Best of luck,

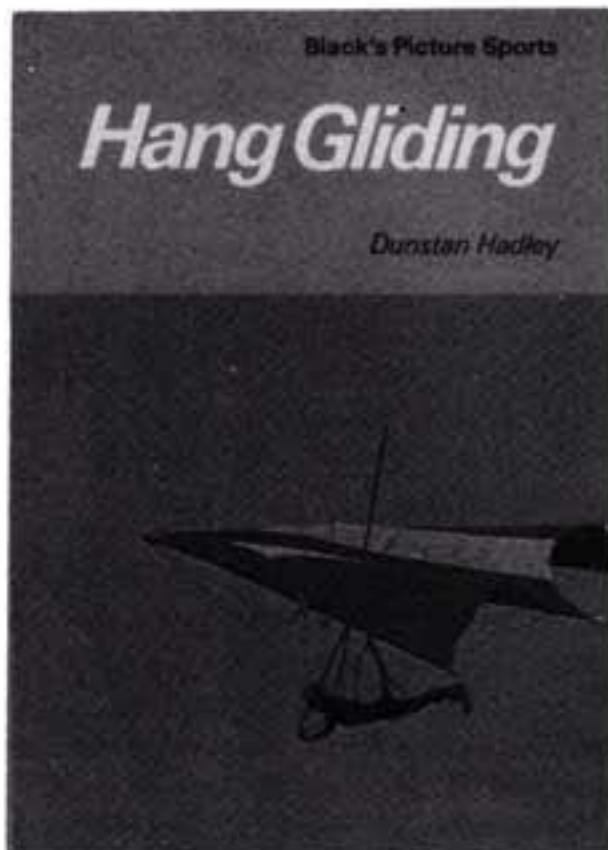
Rick Wilson R&FAIACO

Book Review

Black's Picture Sports: HANG GLIDING

BY DUNSTAN HADLEY

Published on July 12th 1979 by
Adam and Charles Black,
35 Bedford Row, London,
WC1R 4JH. Price £2.50p.



I always tend to regard books aimed at the newcomer to hang gliding with a jaundiced eye. Inevitably they are grossly out-of-date by the time they have emerged from the lengthy publication process and usually they do not offer anything that has not been dealt with before.

Having said that, I was pleasantly surprised when I received a copy of Dunstan Hadley's book just before this issue went to press. Visually it is one of the best books of its type that has been produced.

It is a neat hardback, with colourful cover, and an abundance of excellent line drawing illustrations supplemented by some photographs. The high standard of presentation makes it an appealing book before content matter is even considered.

There, an equally high standard is maintained — marred only by one or two areas that are really out-of-date. The take-off procedure described would be ideal on a standard rogallo. But the tight strap, luffed sail, run, push, pull method is hardly suitable for second generation gliders (which after all are the types that people learn to fly on nowadays.).

Also in a small sub-section headed 'Parachuting' we are told in relation to stalling too high on landing: "Remember that your glider is almost as big as a parachute and will behave like one, and slow your rate of descent. Hold the bar where it is as you come down". In certain situations on second generation gliders that could be bad advice — but perfect for standards.

But apart from those points, the book is an excellent and clearly written introduction to hang gliding for the newcomer to the sport. It fills in many gaps left by other publications and explains everything in a very readable form without losing anything in the process.

The reader is taken carefully through recommended clothing — with explanations for the necessity of each item into the theory of flight, followed by airspeed and groundspeed and control in flight. Take-off, difficult wind conditions and landings are all explained in detail, with a useful description of likely mistakes and their outcome.

A section on flight planning, in the form of aiming for given spot areas, is well laid out with plenty of line

drawings to illustrate the concisely expressed points.

I liked the way the chapter on The Wind was dealt with. Again, everything followed the smooth, easy flow of the remainder of the book and it led through the effect of terrain into cross winds and thermals.

Dunstan Hadley is medical adviser to the British Hang Gliding Association and he has included a useful short first aid section at the end of the book.

His approach throughout the book seems to achieve the right degree of caution, stressing the importance of progressing slowly and sensibly, without appearing pedantic.

In general it is a pleasing book that would be worthwhile reading for anyone new to the sport, or those who have just started flying.

JEANNIE KNIGHT

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FIFTY MILE FLIGHT AND THE BIG 'IF'

BY ROBERT BAILEY



Robert Bailey takes off on his Cherokee. Photo Mark Junak.

Saturday 12th May 1979 dawned bright and clear blue. The forecast sounded good; S.W. moderate with good lapse rate. I decided to head for Littondale, Arncliffe in the Yorkshire Dales, a three-mile ridge, 300ft. at take-off point, rising to 1000ft. best.

On arrival, Dave Harrison was there and we rigged on the lower slopes as the wind was gusting and strong. We had a chat and I decided conditions were favourable for an attempt at Goal Distance flight to Richmond cricket ground. We also discussed the possibility of a cross-country flight together, which would help our chances of catching thermals. The morning was spent being thrashed in some really badly torn gusty thermals so I decided it wasn't good enough to set off and had a break for lunch.

In the afternoon the thermals cleaned up and I hooked into the cleanest, biggest thermal of the day — the whole valley seemed to be lifting. I shouted to Dave to come across as I centred to a steady 600-800f.p.m. up. He shot across, but must have hit the tail end of the bubble and could not get away. A few minutes later saw me at 4000ft. A.S.L. and climbing steadily towards cloudbase. The hilltop is at 1500ft. above sea level.

I worked the first thermal for 15 minutes and reached cloudbase over Great Whernside at 5800ft. A.S.L. On reaching cloudbase I noticed my drift whilst circling was very slow (8 circles-200yds.) and as it was late in the day, (4 o'clock), I decided if I was to make distance I'd have to push on **quick** and not hang around in weak lift.

I glided straight back over Whernside and noticed another hang glider rigging. The view was fantastic and it was countryside I knew very well, having camped in Coverdale many times in my younger days!

I was over Scarhouse reservoir now and could see the wind at ground level, still strong and gusty as the water was well whipped up leaving white caps. How I wished there was some strong wind at this height to carry me faster across the countryside. Down to 4000ft. now and starting to look less at the view and more towards the clouds for my next lift back to cloudbase. Still straight downwind and the vario wanders from 4 down to a steady 2 up. Steady circles 200-300yds. diameter, 4 up tighten then back to 5000ft. (It wasn't that easy, but I've got 45 miles of article to write about!)

West Scafton Moor coming up next, I don't need to look at the map tucked in my pocket as I know the countryside so well and have planned this route back in snowy January. It looks massive and I think to myself — "If I hit heavy sink over the moor I will have a long walk out to the nearest road!" Again my concentration wanders and I'm gliding to the south of Carlton and I'm busy looking at the river; the spots I've fished and tickled trout. Middleham is in the distance and looks miles away — "Will I make Richmond?" crosses my mind.

Down to 3000ft., starting to concentrate more on reaching the next cloud, which now looks far away. The clouds are small cumulus 2000ft. thick closely grouped in places with big blue gaps — and I am in a blue gap — sinking, like hang gliders do — **fast**.

West Witton is below and looks really close. I can see the farmers in the fields, people on the river banks and my thermal spotting sunglasses are not working **too** good, sounds like Tennessee! Down to 2000ft. — I've blown it, no more hills now. It's all flat out front and the clouds are miles above and I need a lift back up. Good looking area to the north so I fly across-wind pulling just enough speed for maximum glide. Sure enough — it's there, 2 up which I work for 10 minutes to gain 3000ft. This is no good as I'm getting nowhere so I head north to a brighter looking area. Noughts and one up all the way but I take no notice as I've been messing about in this bubbly trash far too long now. I hit a four up and tighten which gives me 500ft. I'm just feeling confident and enjoying the view again, when it leaves me. I open up — search — nothing, just noughts, so I head on

down-wind. The clouds look really good 10 miles away. If I can only get back up. I guess this is the Dales sink hole, and I'm struggling.

Another mile in 0's and 2 down and I'm down to 1000ft. real low but feeling confident that just a bit further on I'm going to hit something really good — which is going to get me back up top to where the view is best!

I work another small thermal which gets me back to 2000ft. then dies. I open up the circle and find another active core — 4 up, smooth and big. It's my lucky day (thinks) 2500ft. and it's gone. Maybe it isn't. It's really smooth round here and it feels like it's decaying — nothing active and pumping as it was over the Dales.

Onwards, down-wind, then I see there is a good area to the north — 500 or 600 acres of ploughed land. The sun is streaming down. It's got to be cooking. I'm low again 1500ft. and it's only just working, 0's and 1's on the vario. Circle gently, I'm getting just a little desperate. I've blown it! 2 up on part of the circles, keep climbing and then it dies. Still, I need all I can get out of 'Sink City' (another American term — they keep creeping in).

I work hard for what seems an age, just holding my own, and then it goes — the bubble lifts, and I'm climbing fast and smooth, 2000ft., 3000ft., 3500ft., its fading. The clouds are looking nearer and seem to be building to the east, so I take a chance and pull speed, leaving lift to fly a mile. The hunch pays off and I'm in the best lift for 15 miles climbing smoothly to 4000ft.

Catterick is coming up now. Military camp, with just gliding and parachute drops at weekends. It's really busy. Gliders, barrage balloon etc., and I'm looking down on it all. Not quite a cloud base, I am concentrating on getting there. 5000ft. cloudbase — that's strange — I thought it would be higher in the drier east. Maybe it's the higher wave systems that are about today, pulling the cumulus upwards in certain areas. Richmond is a couple of miles to the north — my declared goal. I'm at 5000ft., the North York moors are to the S.E. in sight now. There's a high performance glass sail-plane 3000ft. below me to the N.E. circling — it doesn't take me long to decide that declared goals are for another day. Let's go get that record back.

Check on the watch — Omega chronograph stopwatch — (maybe they'll sponsor me next time!) and it's late, after 5pm. I've got to push on now to get the miles.

Full speed to the north to my next cloud, which is building over Darlington. The glider feels very good. It's only my tenth flight in the Cherokee, and I get there having lost only a 1000 or so feet. Sure enough the cloud is building and the thermal below is strong.

About 500ft. before entering the base I decide when I get there I'll pull speed fast to the N.E. to get some miles under my belt whilst the sky is still good.

I wish I'd had my goggles on as I hit four clouds lined up which were all working, vario reading only 2 down with the bar to my waist. On flying out of the far side, I hit 8 down which I fly in for half a mile before deciding to head back into wind to climb back under my last cloud. Maybe I'll wait a while longer as the gap looks too big — have to fly with a calculator next time. There's a wisp to the north, so I pull out and glide fast cross-wind to meet it at 2500ft. and steadily climb back in the 'ginormous', very smooth thermal.

On reaching cloud base, again, I can see Stockton to the east with its cooling towers and I.C.I. works. The smoke looks to be coming towards me "Oh no, not a sea breeze". From this height and it's 5.30pm I'm not drifting at all when circling, which leads me to think maybe I'm not going to reach the coast — which I've had in the back of my mind for the last ten miles.

I start to get a little bit worried and decide the best course is going to be to blast on, and try and get as many miles into the sea breeze as I can. Maybe

making it 40 miles.

I've got the bar way down and flying fast, through lift, sink and then start to slow up as I notice the smoke from the stacks is still drifting out on the light westerly wind, towards the east coast, which is now clearly in sight. It's 50 miles to the coast, I've got to make it there.

Just when I need my next thermal it's there. It's my lucky day and I work it back to 5000ft. before leaving it once more, pulling speed, straight downwind towards Hartlepool. There's Middlesbrough to the south, Saltburn to the south east. A cargo boat in the bay — two miles out, Hartlepool straight ahead. No, that's no good. I've got to get more miles so I head up the coast into a big blue gap. There's no future in drifting out to sea and missing your spot landing on a cargo boat with no witnesses on board!! The blue gap is a beauty — 8 down and it seems only a couple of minutes to being in the middle of a housing estate and looking for a flat landing field.

I'm not going to make it up the coast to Sunderland as I had planned, but instead I am skimming between the lamp posts and land in a perfect flat field by the road. A motorist waves as he passes by and I wave back for him to stop — he has seen me glide in and I have got to get my witnesses. It's above the 50 miles mark and he is pleased to sign as a witness. Two minutes past 6pm, I've landed at Hartlepool having run out of land. I grab a couple more witnesses as I'm de-rigging who have seen me fly in, and then start to think of how to get home. It's taken me two hours to cover 50 miles using lots of different techniques that I've never used on previous cross-countries. Pulling speed, leaving lift, and flying fast cross-wind. It has all paid off.

The local club round these parts is the N.Yorks and I wonder how good my friends are. Bill Hopkins is one of the most helpful guys around so I rang with y

is one of the most helpful guys around so I rang with my fingers crossed. Told him the good news and asked for a lift back. Fantastic, I've got friends. He offers me a lift back, no problem, and we drive back into the sunset for three hours on the winding roads arriving late at night, back in the dales — the 'hard work' part of cross-country flying. Thanks Bill.

On looking back at the flight I suppose I might have blown it six or eight times but each time the decisions I made were the right ones for the particular flight at that time of day. I'm quite sure I could have flown a lot further if (the big 'if') England had not eroded so much on its eastern coast line. 60, 70, 80, 100 miles, who knows? I wasn't all that tired when I landed, just very jubilant and my ears were popping from the fast descent.

I think it's possible to get the world record and Gold Goal distance in the U.K., but site and route planning are going to become more a part of hang gliding to do these types of big flights.

EQUIPMENT USED

1000ft. hill

Cherokee 220

Colver Variometer, Altimeter
Compass

Hiway prone harness

Thermal detecting sunglasses!



INTERNATIONAL DRAW RESULT

First prize: One hang glider, Richard Worth.
 Second prize: Vario or trip to Grenoble. S. Kynaston.
 Third prize: Altimeter. A. Lewis-Evans.
 Fourth prize: Altimeter. M. Stevens.
 Fifth prize: £50 worth of Mainair goods. C. Phillips.
 Sixth prize. Protec Flying suit. Phil Brigstock.
 Seventh prize. Compass. T. George.
 Eighth prize. Bomber Jacket. J.A. Cunningham.
 Ninth prize. Gloves. M.A. Jaynes.
 Tenth prize: Birdman equipment bag. Ian Coppinger.

Over the weekend of the 2nd/3rd June, the Dover and Folkestone Club were hosts to the Briforge and Trier hang gliding clubs from Germany and during our Saturday evening party at the home of Paula and Robin Lewis, the winning tickets were drawn from their 100-year-old butter churn.

Making the draw were some of our gorgeous ground-crew, wire-women and keel-pushers. Congratulations to the winners and thank you girls for adding such glamour to the draw.

Grateful thanks too from the Competitions Committee to all those who supported the draw — we took in £2,800 and made a

profit of around £2,100 which will go a long way towards funding the International competitions this year. A big thankyou also for our long-suffering manufacturers who offer the hang glider prizes at a reduced price to BHGA — Birdman, Chargus, Hiway, Skyhook and Waspair.

A final pat on the back to our other sponsors for prizes — Birdman harnesses, Protec flying suits and Mainair sports goods.

DEREK EVANS



Audrey Evans, who took all the money, draws out Richard Worth's winning ticket.



Judith Brenchley draws an altimeter for A. Lewis-Evans



Sue Hart enjoys giving C. Phillips his £50 worth of goods

(Photos Peter Brenchley)

CASH!

CASH!

CASH!

Join the 500 Club and get yourself a ready income!

Details of the **CASH LOTTERY** which starts in September are shown on the insert with this month's magazine.

Don't miss this opportunity of earning yourself a huge, tax free cash prize each month.

If one third of the membership joins the scheme, you have the chance of winning £250 cash each month, each month, each month!

HURRY HURRY HURRY

INTERNATIONALS DRAW 2



*Remember your name could appear on the winning tickets this time . . .
(Photo Peter Brenchley)*

By popular demand, but mostly because we need the money, we are running our last fund raising exercise in support of the 1979 International Competition programme. At the time of going to print, we are without a sponsor for our competitions and unless one comes along **and** the draw is a roaring success, we may not be able to afford to defend the American Cup in October.

So, dig deep again and try to flog the tickets which are enclosed with this magazine. Our prestige as a leading hang gliding nation is at stake more than ever this year following last year's successes in Europe and America.

The prize list has a wider appeal this time, so perhaps your friends and workmates might like to contribute. . .

OVER £800 worth of prizes to be won.

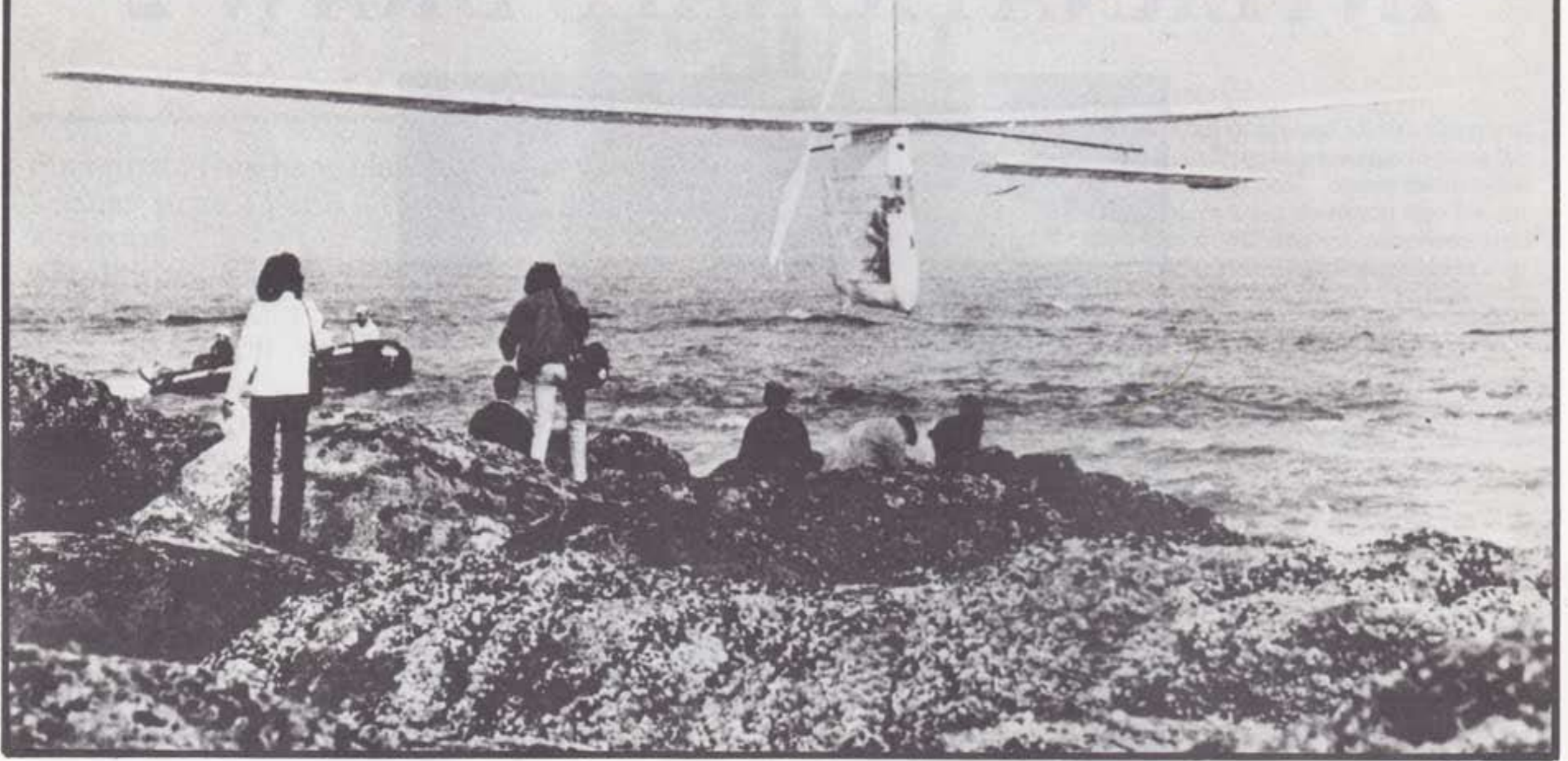
- 1st Prize** Hang glider of your choice **or** National Panasonic Music Centre (1090)
- 2nd Prize** Colver Variometer **or** Tasco Binoculars with built-in camera and telephoto lens.
- 3rd prize** Colver Variometer **or** Konica Automatic Exposure and Focus Camera with built-in electronic flash.
- 4th prize** Prone harness of your choice (UK) **or** Sony Portable Cassette Radio (160—
- 5th Prize** Thommen Altimeter **or** Sony Digital Clock Radio (160)
- 6th Prize** National Panasonic Portable Cassette Recorder (301)
- 7th Prize** Braun Electric Shaver
- 8th Prize** Sony Portable 3 band radio (6100)
- 9th Prize** Protect Flying suit and Birdman Equipment bag
- 10th Prize** Swinto Compass **or** Sony Pocket-sized Radio

Tickets 25p each — must reach BHGA Taunton by Thursday 6th September. Draw takes place at 6pm on 8th September 1979 at the Mere Fly-in. Cheques and P.O.'s payable to BHGA.

Money and tickets to be sent to Chris Corston (promoter) BHGA, 167a Cheddon Road, Taunton, Somerset.

Hang glider may be chosen from Birdman, Chargus, Hiway, Skyhook or Waspair.

GOSSAMER ALBATROSS



A Flight of Imagination Realised By David Worth



Counter No.	Certified Copy		Serial No.
Office Stamp <i>David Worth</i>	POST OFFICE INLAND TELEGRAM FOR POSTAGE STAMPS		Chargeable words
1 JUN 1979	Number 12.6.79	Service Instructions TAUNTON BS SW	Best as by Charge
BLOCK LETTERS THROUGHOUT PLEASE			
TO PAUL MACCREANT AND TEAM 27 VICTORIA ROAD DEAF KENT			
CONGRATULATIONS ON THE AVIATION QUANTUM JUMP OF THE CENTURY ALL MEMBERS OF THE BRITISH HANG GLIDING ASSOCIATION			
The particulars on the back of this form should be completed.			

Photo by Don Monroe



The Pilot — Bryan Allen

On August 23rd 1978 Bryan Allen made history by piloting Paul MacCready's Gossamer Condor around a 1.15 mile figure of eight course to win the Kremer prize of £50,000. History's largest aviation prize had lain unclaimed for 18 years. Less than one year later the incredible happened, the Gossamer Albatross flew from England to France under leg power alone — a distance of 22 miles. Bryan Allen, the triumphant pilot described this remarkable achievement as 'neat'. Probably the greatest understatement of all time.

The driving force behind the Gossamer story has of course been Dr. Paul MacCready, whose history of aero-innovation deserves more than a mention. Born in USA in 1925 he became a model aeroplane enthusiast, but soon graduated to real flight gaining his PPL at 16. During World War 2 MacCready was assigned to the US Navy flight training programme. By 1947 he had earned his B.Sc at Yale and his interest turned from powered aircraft to gliders. He soon bought a competition glider, the 'Screaming Weiner' and took second place in the US National Soaring Contest at the age of 21.

In '48, '49 and '53 he won the Nationals and pioneered high altitude wave soaring in the USA. He later became the first American to win the International Championships in France. During the decade 1946-56 MacCready worked on sailplane development, soaring techniques, meteorology and invented the speed ring which is used world-wide by glider pilots. He earned his M.Sc then a Ph.D in aeronautics, ran a cloud seeding project and developed an armoured aircraft for flying into hailstorms. Since 1970 MacCready has run his AeroVironment Inc. company, involved in manufacturing air-drag reduction devices for fuel conservation in the trucking industry, worked in industrial pollution abatement, wind power systems and made investigations

into aircraft vortex wakes. Then came his triumph with Gossamer Condor in 1977.

After his success with the Condor, MacCready, with material help from Dupont was able to modify and refine his original design producing a craft which needed only 25hp to fly compared with the .33hp for his earlier model. The Condor was relatively crudely constructed weighing in at 70lbs, and materially could have been built 40 years ago. The Albatross retained the same constructional principles but used material which undoubtedly made it a plane of the '80s.

All structural tubing on the Albatross was home manufactured from graphite. The carbon fibre/resin was pasted on to aluminium tubing, wrapped with tape, and baked in a makeshift coil oven. After proper curing, the tape was removed, and the aluminium removed by prolonged immersion in an acid bath. Mylar Polyester film, 0.0005 inches thick covered the wings weighing only 3lbs for the whole craft. Gone were the piano wires of the Condor and in came 'Kevlar Aramid fibres. 'Kevlar' has previously been used in reinforcement of radial tyres, conveyor belts and soft body armour. The conventional bicycle chain was replaced by a urethane toothed belt. The aerofoil was smoothed out with more low density expanded polystyrene ribs and 'Delrin' Acetal resin pulleys were used. Wherever possible components were either disposed of, or built of polystyrene (like the beautifully shaped air-speed indicator propellor). MacCready had said, "If it didn't break on crash landing we would replace it with something weaker and lighter". However the Albatross was not without an instrument panel, which not only had the airspeed indicator, but a sonic altimeter capable of measuring altitude accurate to 1/2 inch. Weight was reduced ounce by ounce. However, before the attempt, the Albatross was still 6lbs overweight from cellotape repairs effected after the multiple 'dings' during practice. Close examination revealed delightful additions such as internal lolly stick deflexors.

Here it was then - the Gossamer Albatross - 96ft. wing span, flying speed 10-12mph, stall speed around 6mph, sink rate 6ins. per sec, weight 55lbs. Cost of the project so far: £100,000. Prize to be won: £100,000. Rules: To fly from anywhere in England to anywhere in France, starting at less than 15ft. ASL and never exceeding 160ft. ASL for more than 3 minutes. Major problems: visibility, wind, big ships and overheating of cockpit with no ventilation for pilot.

There were two back up craft. The Gossamer Albatross II — a more efficient Gossamer Albatross I and the Gossamer Penguin — a racy 72ft. span version which may eventually be the prototype for a kit design. The back up crew included well-known Taras Kiceneuk of Icarus fame and top US competition pilot Sterling Stoll.

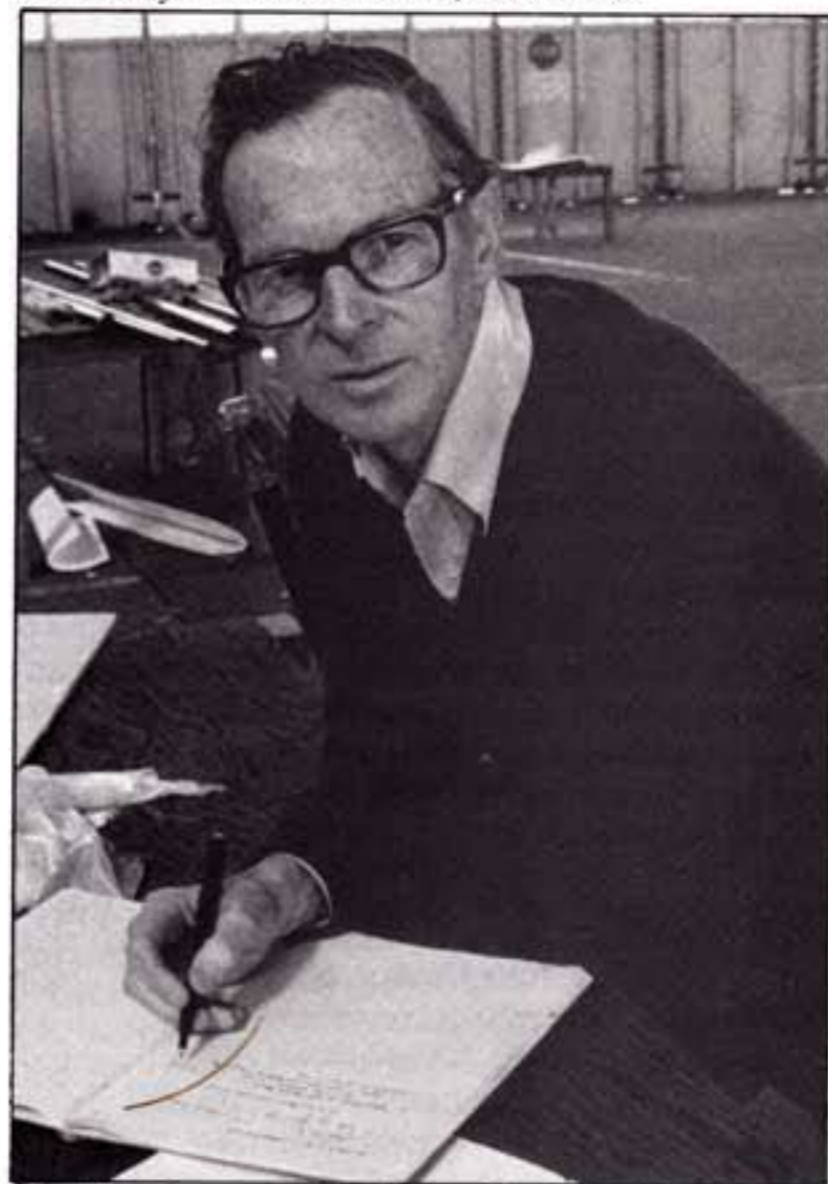
Bob Kelly continues story with an eye witness account of the take-off at the Warren, Dover.

The English Channel which has long been the subject of a variety of man's attempts to prove his superiority over the elements, has had to concede yet another defeat.

This time to a slightly built American, whose stamina and ice cool nerve, matched the inventiveness and sheer genius that had produced the aircraft which he piloted.

The Americans had assembled at the take-off point at the Warren, (which is one of the Dover & Folkestone Hang Gliding Club's 'landing' areas) Folkestone, at around 0230 hrs. on Tuesday, 12th June, and were quickly joined by an enthusiastic crowd of well wishers, and some seven or eight film crews, from various parts of the globe.

A small armada of boats were already anchored off-shore, containing the American's ground/sea crews, the press, the Aeronautical Society observers and sightseers.



The Designer — Paul MacCready

There followed a tense and expectant four hour wait, whilst weather forecasts for both the English and French Coastal areas, together with the mid-channel conditions were anxiously reviewed.

At long last, Paul MacCready announced that, although conditions in the channel were not considered to be perfect, an attempt was to be made.

The ground crew then sprang into action, laying a number of pieces of linoleum across the extremely rough surfaced concrete, to form an incredibly short and narrow runway measuring approximately 30ft. x 6ft. and the pilot, Bryan Allen, stripped down to a tiny pair of shorts, cycling shoes and a light-weight crash helmet, and was then sellotape sealed into his flimsy cockpit.

There then followed an extremely tense 15 minutes or so, during which the pilot limbered up, by slowly pedalling, causing the enormous propellor to revolve lazily, and the ground crew, frantically cleared various press men from the flight path.

Suddenly, all systems were go, and the craft began to move slowly along the tiny runway, travelling upon the two miniscule fore and aft mounted plastic wheels when to everyone's horror, the Albatross slewed across the runway and the front wheel ground into the uncompromising concrete, accompanied by a loud crunching noise, and the machine stopped dead.

The atmosphere at this point, was one of miserable foreboding, as the Albatross appeared to have sustained a mortal 'dink'. Amazingly, the ground crew pounced upon the machine, armed with sticky tape and a spare wheel, and within 40 minutes, machine and pilot were once more poised at the top of the runway, which had now been lengthened, by the addition of three large wooden boards.

The aircraft again began moving along the runway, gaining speed at an unbelievably slow rate, and all hearts were in mouths when the end of the runway was reached, and the now horribly familiar 'crunch' was heard, as the front wheel hit the concrete. As if spurred on by the previous experience, the machine immediately left the ground amid relieved and jubilant cheers, and smoothly turned towards the sea, in the direction of the French coast.

Everyone present was amazed and delighted to see how beautifully stable the Albatross flew in the light morning wind, and the confidence of success expressed by the people I spoke to was easily justified when the Gossamer Albatross landed on the beach at Cap Grinez some two hours later.

FATAL ACCIDENTS

JIM PAYNE

Jim Payne, aged 27, of 26 Kings Road, Wimbledon, was killed while flying a Vulturelite Emu at Devil's Dyke, Sussex, on Saturday June 16th. The glider was seen to get into a whipstall situation, after which the glider folded up and impacted halfway down the slope, 200ft. beneath. The pilot was killed instantly.

Jim, who was a pilot badge holder, was a member of Southern Hang Gliding Club and a regular flyer. He gained second place in the Advanced section at the recent Steyning Bowl Championship. It was his first flight on the glider.

Following the accident, BHGA Investigation Officer, John Hunter, placed a prohibition on aerobatics on Emus as a precautionary measure until the cause of the accident is determined.

He warned that a whipstall is a highly dangerous manoeuvre which should not be attempted in any circumstances on a hang glider. The glider was apparently correctly assembled for flight.

A more detailed accident report will be in the next issue of *Wings!*

JOHN OGDEN

Within the same week there came news of the death of John Ogden, the Australian flyer who was third in the 1977 Mere Open. He died whilst flying at Fendas in northern Spain.

He was in charge of the Moyes factory at Vitoria, Spain, where gliders were produced for the European market. Early reports indicated that the cause of the accident was turning too close to the hill and stalling.

LORRAINE EVANS

A member of the Malvern Club, student nurse Lorraine Evans was killed whilst flying in France during the same week as the above two accidents. News came through as *Wings!* was going to press and the only other information at this time is that she was a Pilot 2 holder.

LES OSBALDSTONE

It is with deep regret that we have to announce the death of Les Osbaldstone on the afternoon of Sunday July 1st., following a hang gliding accident at Combe Gibbett.

Les was an enthusiastic and very active club man. A great loss to us all.

On behalf of the Club I would like to extend our deepest sympathies to his wife Sue.

Rick Wilson
Thames Valley H.G.C.

TRAINING COLUMN

LEARNING TO FLY PRONE

Too many pilots try to change from seated flying to prone flying far too soon and with too much impatience. The important thing to remember is that it is like starting all over again. The change should be made progressively and with as much care as was given to learning to fly seated in the first place.

The sensible thing is to take a prone conversion course — even one day will help to set you off on the right footing. The other thing to remember is the 'Three inexperience's'. **DON'T** make your first prone flight on a new glider on a new site. It is asking for trouble. Learn to fly prone on a glider you are familiar with and on a site that you know well.

If conditions are doubtful, don't fly prone. After all, would you have made your first few seated flights in turbulent high winds? Remember you are a beginner again and just as vulnerable.

Before you attempt any prone flights you should spend a good half-hour hanging in the garage or from the loft practising the different turning techniques and getting used to the harness. Keep your head in the centre of the bar and move your legs and hips in the direction you want to go. Don't

move your head until you are more experienced.

Programme yourself in the following way when learning to fly prone.

1. Two or three straight flights to achieve take-off, pitch control and landings.

2. Three to five flights off a 200ft hill with turns, setting yourself targets to aim for on turns.

3. Three soaring flights on a very smooth site that is an open fronted ridge, with enough lift to enable you to stay well away from the hill.

Practice coordination of turns and beware of too much pitch control.

4. Progress slowly to trickier conditions.

Golden Rules

Check harness height before take off. Fly only in smooth conditions to begin with.

Do not scratch around until experienced.

Remember you are a novice again.

Look around carefully — your vision is more restricted than when flying seated.

Pull on speed coming into land and slow down gradually in ground effect.

Stay prone as long as possible in flight.

FACTORS FOR A STALL

Many accidents occur because otherwise sensible pilots stall inadvertently. There are two basic reasons for this.

1. Their concentration is elsewhere — such as trying to avoid a collision with another glider, or because they are temporarily carrying too high a workload — such as flying and worrying about income tax.

2. Because they have got, or are getting themselves into a situation beyond their skill and experience and are flying with increasing inaccuracy.

In relation to the first point — if you can't concentrate for whatever reason, then don't fly. But as far as the second point is concerned, there are several traps waiting for the unsuspecting flyer.

These include:

*Stalling in a turn, caused by flying with insufficient air-speed to cope with the increased loading.

*Stalling in a wind gradient, because of failing to realise that the wind close to the ground or face of the hill is less strong. This can occur when ridge soaring very close to the hill, as well as when landing at the bottom of a hill.

*Stalling when flying out of a thermal or large gust.

*Stalling when flying downwind, due to seeing the ground rush past and mistakenly reducing speed in the belief that the glider is flying too fast. This is the most common way of stalling by mistake.

*Stalling when starting to fly prone because of the different pilot position and attitude, or through looking to see where the stirrup has gone or through flying with the control frame as for the seated position.

One problem by stalling inadvertently is that even if you act correctly, some height will be lost in regaining flying speed. At the worst this could result in the glider hitting the hill. Even if you avoid this, the glider is likely to be off course and will need correcting. Another problem is that of instinct. In all your flying, whenever the nose has dropped you have pushed out on the bar to raise the nose again. If you stall and do not appreciate why the nose has dropped, your immediate reaction will be to push out the bar. It is of course the worst thing you could do because at this critical instant you should be trying to regain airspeed.

DON'T HEAD FOR A STALL

CLUB COACHES AND DEPUTY CLUB COACHES

Anderson, Bill: Angus HGC.

Andrew, Robert: R.G.I.T. HGC, Aberdeen.

Beard, Dave M.: North Devon Sailing Club.

Bell, Graham: The Peak H.G. Assoc.

Best, Peter: Sheffield H.G.C. Ltd.

Black, Roger: Western Counties H.G.C.

Coppola, Paul: Lanarkshire Soaring Club.

Cronshaw, Keith: Pennine H.G.C.

Downer, Simon G.: University of Stirling Sports Union H.G.C.

Forrett, Michael: R.G.I.T. H.G.C., Aberdeen.

Gardiner, M.R.: The Sky Surfing Club

Geary, Sam.: Peak H.G. Association

Green, Ron.: South Essex Skywing Club

Harthman, John.: Sheffield H.G.C. Ltd.

Horsfield, Eddie.: Southern H.G.C.

Ingram, Charlie.: Aberdeen H.G.C.

John, Ivor.: Aberdeen H.G.C.

Knowles, Tony.: Western Counties H.G.C.

Lark, Colin.: Avon H.G.C.

Lees, Rod.: Mid-Wales H.G.C.

McKinlay, John.: Lanarkshire Soaring Club

Moss, Steve.: Avon H.G.C.

Ogston, Simon A.: Angus H.G.C.

Parkins, B.: The Sky Surfing Club

Parsonnage, Peter.: Mid-Wales H.G.C.

Patch, Nigel.: University of Stirling Sports Union H.G.C.

Pattenden, Brian.: Suffolk Coastal Floaters

Renshaw, Brian.: George Caley Sailing Club

Richings, Russ.: South Essex Skywing Club.

Sharpe, John.: Suffolk Coastal Floaters

Sheaf, Ken.: North Devon Sailing Club

Smith, John Howard.: Malvern H.G.C.

Taylor Captain D.: Briforge

Trickey Lt. R.: Briforge

Ware, Rick.: George Caley Sailing Club

Whitfield, John.: Lothian H.G.C.

Ellison, Chris.: Hatfield Poly. H.G.C.



THE GEORGE WORTHINGTON COLUMN

The Cross Country Classic began at Bishop, California on July 7th, with a British team participating throughout the eight days of the contest. George Worthington hopes that their entry to the event will stimulate British pilots from beginner to expert and will add excitement to the World's first cross-country hang gliding championship. Here he describes some of the things relating to the event and says how it can be of interest to the beginner.

The Competition tasks used in the Classic are very simple. First let me tell you what it won't have spot landings. It won't have spot landings. It won't have "timed" runs where the pilot is supposed to arrive at a certain place at a certain time. It won't have 360's or figure eights near or over pylons. There won't be any pylons. It won't have endurance tasks where the pilot tries to stay in the air for a prescribed period of time. It won't have landing accuracy or landing style points.

It will have open distance tasks measured in a straight line. That task will be scored on the relative basis of who flies the farthest, with the leader garnering 1000 points and the followers receiving a score relative to their distance flown. It will have speed tasks to a particular pre-set landing area of 25 to 40 miles distance. In these tasks, each pilot, taking off when he or she chooses, will be timed so that an average ground speed can be measured for each pilot. Again, on the weather, there may be one out-and-return speed task of about 25 miles round-trip distance. And there may be one task where the pilot can take off at any time after 12 noon, and fly to a pre-selected landing site. The winner will be the first pilot to arrive at that site, etc. This is an extremely exciting task because the condition of "sustaining lift" doesn't usually arrive till about 1.30 or 2.00 or even 2.30 p.m. If you take off too early, you risk not being able to even remain airborne. If you wait too long, you risk being severely beaten by the pilots who "risked" taking off too early. In all cases, the winner of each day's task will receive 1000 points.

If the weather remains excellent for the first 4 or 5 days of the contest, there will probably be one rest day (or free flying day) "declared", before going into the final two contest days.

How can this be of interest to the beginner? First of all, I must assume that the vast majority of experienced pilots have realized by now that the most exciting, thrilling and rewarding type of hang glider flying is cross country. If you are a beginner, you will have to go on faith that that is a true statement. Some will say that all they desire, is to "stay up", and enjoy all the beauty and delight of hang glider flight. I respect this attitude. But whether we realize it or not, all of us are excited to an ever greater degree by the increase in surprise, wonderment, and challenge of finding by actual trial how far we can go cross country in that terribly challenging endeavour of pitting our wits, skill, and experience against that of Mother Nature. If you haven't tried it yet, believe me, you *will*, if you have any real degree of love for *flying*. Others will say: That's very nice, but in my case I have no desire to *compete* in any kind of formal competition. I respect that attitude also. But I would like to say that after all, life itself is a competition, is it not? And while we are more or less forced to compete in the many faceted areas of life's needs (money, food, comfort, material things, skills, etc., etc.) there is, I believe, lurking somewhere inside all of us, a possibility of greater fulfilment by preparing and training for a

particular type of competition and then *competing*.

How do we become skilful and proficient at cross country flying? Basically, we try. We fly enough flights just-down-to-the-landing-area, so that we have confidence and ability to do that task really well. Then we try to learn how to most efficiently use all manner of life conditions. Next, we begin perfecting our skills in making a safe approach, and a safe landing, in areas we've never seen before. After that, we search for and find other pilots who enjoy flying cross country. We go with them and give it a try, and compare notes afterwards. Now we have a beginning. We can continue this friendly-cross-country-fun indefinitely, or if we are willing, we can proceed to the next step or actually entering formal cross country contests. I can guarantee you that the very best cross country contest in the world, at present, is the Annual Cross Country Classic. The proof of my statement is that every single pilot who competed, during the entire 1978 Classic, said that it was the best, the biggest, and the most exciting and

thrilling hang glider flying he had ever done. All British pilots who decide to enter, and to *finish* the contest, will, I believe, feel exactly the same way.

The type of cross country flying done in the Classic is basically that of using thermals to climb, and then gliding to the next thermal. On all of our total distance tasks and on some of our pre-selected landing site tasks we will normally be flying along and near a mountain range with bases at 4500 feet ASL and tops at 12000 to 14000 ASL. But this lasts for only 25 miles. Thereafter, for the next 50 miles, the flight will pass over a hodge-podge of hills and valleys. As I recall, we had 3 or 4 flights over 70 miles and 6 or 7 over 60 last year.

For reasons of safety, the total number of entries will be quite limited in comparison to my belief of those who will want to enter. The "word" is out, and I'm expecting hundreds of applications. However, only 50 pilots can take off, at their choice of time, without filling the sky so full of hang gliders (in the area within 1 miles of take off) that the possibility of mid-air collision becomes prohibitively high. Even 50 is a high number. The pilots want to win, and when they see good conditions arriving, as shown by four or five gliders climbing above their heads, they tend to all take off at once, and that little patch of sky can become very dangerous. Just when you're trying very hard to keep two or three nearby thermalling gliders in sight, several more sneak up on you from your "blind side". Safety is relative. This problem is held to relatively safe limits *if* every single pilot is very, very conscious of the problem and its implication for hazard. We had no collisions last year. We do not expect any this year. But in order to have a fair degree of insurance of this safety, it is absolutely necessary that all entries be experienced and capable pilots.

Camping out in the Owens Valley is practical and comfortable in July. Just bring a sleeping bag, mosquito netting and the usual camping gear and save money.

It is my understanding that the entry fee will be very close to eighty dollars. This will include transportation each day from Bishop to the take off site. You will need a camera using 126 film. Film will be provided. You will need to arrange your own retrieve after each day's flight. (I recommend that 6 or 7 pilots hire one vehicle and obtain one driver, so that costs can be held to a minimum.)

The Classic is held at Gunter Canyon, 10 miles N.E. of Bishop, California. The present hang gliding Out and Return Record was made at Gunter in July of 1977. Seventy-five miles further South, Cerro Gordo offers a great opportunity before or after the Classic. The other three hang gliding World Records were made from Cerro Gordo in 1977 and 1978.

Naturally I will be one of the contestants at the 1979 Classic. I hope that some of you British pilots will also be there.



George Worthington Photo © Bettina Gray

PILOT GRADING SCHEME

Task Forms

Please ensure that your Pilot Two task form has a minimum of two signatures and that all sections (1-11) and the final declaration are observed and signed off.

Task 11 should be signed by the Observer giving the exam. Make sure that you quote your current BHGA membership number and your address.

Task 11

The exam requires the best correct answer and not partially correct answers. Failing the exam — that is getting less than 80 per cent correct in each section — means the applicant will have to wait a **further four months** before he may reapply. So ensure you know enough to pass first time.

Observership

To become a BHGA Observer you must fill out an observer application form. These are available from member clubs and BHGA central office at Taunton or direct from the Training Officer.

When applying make sure that (a) your BHGA Membership is current. (b) you are rated under the old Pilot Grading scheme (Pilot badge holder). (c) you have applied for entry into the new Pilot Rating Scheme. (d) the form is correctly filled in and is legible.

Observers must ensure that a pilot has skilfully completed a task and that he had at least the minimum flying ability required by the task. Don't take a pilot's word for it that he has done the task.

Coaches and Observer Courses

Unfortunately Plas-y-Brenin will not

be available during the summer months. On reviewing the situation it appears that combined Club Coach and Observer courses for the following five areas will be the most effective way of covering the country: The South East, the South West, Midlands, North and Scotland.

We have recently contacted your club coaches with the dates and venues. For further details please contact your club coach or secretary.

Course content

The two day courses are likely to include instruction on the following, though wherever possible additional specialised lectures will be given on associated subjects.

1. BHGA — its purpose and functions.
2. The Coaching Scheme.
4. The Role of Observers.
5. Safety and Site Management.
6. Basic First Aid.
7. Parachute care and maintenance.
8. Airworthiness and maintenance of equipment.

I hope that all of your clubs observers will be able to support your Club Coach in the first in the series of Coaching Courses.

Note to all pilots

When applying for any licences, badges, ratings etc., let us have the following:

- (a) Your current BHGA membership number.
- (b) Name
- (c) Address
- (d) What you want
- (e) Any necessary fee

KEITH COCKROFT

OBSERVERS

1. Letter to Observers — Transferring from Old to New. Pilots transferring from the old Pilot Grading Scheme to the new Pilot Rating System, since the launching of the new system, are having their old Grading Application Forms returned to them together with their new Task Cards, to use as evidence of previous observed flights. All flights that were completed and observed on the old Task Form may be, where applicable, transferred on to the Pilot Two Task Card by an Official Observer.

2. Before the pilot is given the examination (Task 11) he should be thoroughly tested (under Task 10) on his knowledge of Air Law, Navigation and Meteorology. This is to ensure he is of an adequate standard to pass the exam. If he fails, he will have to wait for 4 months before he may retake the exam. Hopefully this will ensure, within reason, that every Pilot has a 99% chance of passing at the first time!

3. Task 11 must be signed and dated by the person who gave the examination.

4. The final check, when signing the Pilot off and Pilot Two task card, requires a separate Observer, who must check and know that the Pilot is of Pilot Two standard and then sign the Pilot onto his Pilot Three task card, (which, the Pilot retains) and continues with his Pilot Three tasks.

5. To attempt the Cross Country tasks, (Task 3-P.3 task card), the Pilots **must hold the Pilot Two badge**, (the completion of the Pilot Two task card only means that he has done the examination **and not necessarily passed it — receipt of the badge means that he has passed**). If he fails then he must wait at least another four months

before he may attempt the exam a second time.

6. Please ensure that:

(a) your name is on the current list of Observers, before signing any task forms.

(b) your Observer Number is correct, you have entered the Pilot Rating System and hold both the Observer and Pilot Handbooks.

(c) most important, your membership of the BHGA is current.

PLEASE read your Handbooks and Task Cards before returning the completed Task Cards. All the answers seem to be there but, if any further clarification of procedure is required, please do not hesitate to contact me.

The Pilot Rating System is being administered at Taunton Office. If there are any queries requiring either clarification or perusal, could you **PLEASE** write to me at Taunton Office.

PILOTS Any Member not yet having received his Pilot One rating, but who believes he is of the required standard may apply for Pilot One rating by obtaining a written recommendation from his club coach certifying he is of the required standard. This recommendation must be endorsed by a BHGA registered Instructor. The recommendation must then be sent to central office at Taunton with the appropriate fee of £3.00.



TO ALL HANG GLIDER PILOTS

*We are two hard working
Office girls
But listen to our plea*

*We're trying to make out Pilot
forms 1, 2 and 3,*

*But it's rather hard to find a home
for just TOM JONES you see —
He could be anywhere from
Scotland to Capri!!*

*So hang gliders all — addresses if
you please
'cos if this doesn't work we'll be
on our knees!!*

from
Lynne and Jeanne
at BHGA Head Office (Taunton)

*Chris Hopkinson on final
approach near Shanklin Pier
during Isle of Wight Hang
Gliding Club's recent Fly-In.
Photo: R. Coles*

SNIPPETS FROM MANUFACTURERS

WASPAIR DROP TESTS

Waspair completed some drop tests to conform with European safety regulations on Tuesday May 15th 1979 at Warren Barn Farm, Warlingham, Surrey.

Present for Waspair were Robin Haynes, Barry Bourne and Terry Bourne. BHGA was represented by John Fack and Bob England while other witnesses were George Steffl (Germany) and Alios Sgier (America).

Gliders tested: Falcon V, Laser L 190 and Gryphon G160-G180. Also a prototype aircraft was tested with great success.

The requirements for Europe and America far exceed British hang gliding specifications and because of their volume of exports, Waspair opted for the European test.

The weight used was 80 kilos hanging through the uprights, allowing the weight to rotate freely in line with regulations. The height at the top of the jib was 150ft. and from gliders around 137ft., (the European allowance is 165ft. from the nose of the glider). All pulled out well in time.

FALCON V



Falcon V

Falcon well on its way out.

Falcon continues.

Almost level weight shifting rear of control frame.

Laser

A second after release already pulling out, weight still at nose of aircraft.

Weight begins to travel back as glider rotates around it.

Flying straight — this glider got through the trees and into a car park. We watched helplessly as it landed next to a T reg. Saab turbo. . .

Gryphon

A much faster aircraft whistles earthwards.

Starting its way up again.

The conversions, note the way the airframe gust relieves well.



LASER



GRYPHON



THE VJ 23E AT BIGGIN HILL AIR SHOW

By Dave Cook

Biggin Hill is undoubtedly the most evocative name an airfield can have. It is a name automatically associated with the 'Battle of Britain' and to take part in the air display means flying before 90,000 people. My powered hang glider and I did just that this year and it was a real honour.

Press Day was a blow out with 50mph winds, so the VJ 23 E had to stay in the hangar with its military and civil guard. The following day was also a case of no flying, and all the action came on Saturday and Sunday.

Talking to other pilots, I had some very forceful views put to me about the military pilots' views of hang gliders. I learned that they don't mind us at all and it is hang gliders flying in restricted areas that arouse animosity.

Apparently it happens often and it is understandable that a military pilot doing his job should get annoyed when he finds a hang glider in his airspace, which is a restricted area.

The general consensus of opinion was that hang gliding should have sites of airspace for hang glider usage only, and that if a cross-country was to be attempted, a NOTAM must be obtained. From all other air users' points of view, it is always they who have to miss us — never us to miss them. Perhaps that point of view is sometimes missed by hang glider pilots.

I find it a little amusing how everyone seems to hate CAA. All the pilots, aircrew, manufacturers, organisers — they all seem to treat them as the CIA. I suppose it is true to say that out private aircraft industry has been stamped out by the CAA — one has only to try to count British designed private aircraft on an airfield in comparison with American or French. Ninety-five per cent are always foreign.

VJ 23E on display.



“It was quite a sight inside the hangar — an armed guard was on duty day and night, inside the hangar and outside, to protect two Spitfires, a Hurricane, a Mosquito, two Sea Furies, a Swordfish, a Firefly and one VJ 23 E powered hang glider. Ah! The BHGA has arrived at last, I thought!”

Dave Cook had been asked to participate in the famous Biggin Hill air display earlier this year and he describes the event here.

The Air Show organiser at Biggin Hill cleared all the display aircraft with the CAA in order — with the exception of the powered hang glider! We were told 'no-way' for this aircraft. Only when the matter was taken up with the hierarchy of the CAA, whose director admitted there was nothing illegal about a powered hang glider, was clearance given!

The flying programme was intense and Day One saw me on the threshold of the runway for my short time in warm bright weather, with zero wind. Not really the ideal situation to guarantee take-off in front of 90,000 people!

As I lifted the VJ 23 E to start my run, the engine was showing 7,600 RPM on the tacho. All seemed OK, but a light gust of wind swung my heading more than 90 degrees to starboard. The take-off run commenced into this wind and I had to time and fly off the runway 180 degrees from the direction originally intended . . .

I didn't think this could have looked too impressive to the capacity filled pilots' tent directly opposite. My mouth went very dry. However I was airborne after grazing over the runway and fence and the road immediately behind it.

I had a ground drop of several hundred feet below me — the famous Biggin Hole. I was admired by the pilots afterwards for going into this dip but unfortunately I hadn't intended to do this. The VJ 23 was a full climb but the sinking air was greater than my climb.

My thoughts were very collected as I thought of the connotation of the first powered hang glider participating in the biggest air show in England, hopping off the runway end and disappearing below the horizon for good!

In the mildest terms the situation has to be admitted to be a potential embarrassment to everyone. However, with a considerable amount of praying, some skill no doubt, several 360s, I grazed back over the road and onto the airfield. The normal climb miraculously occurred and I blazed into my flight routine.

The crowds loved the powered hang glider. They could see the pilot and it was slow enough for them to see the machine in detail and the ovation it got after I landed was akin to Ipswich Town scoring at home.

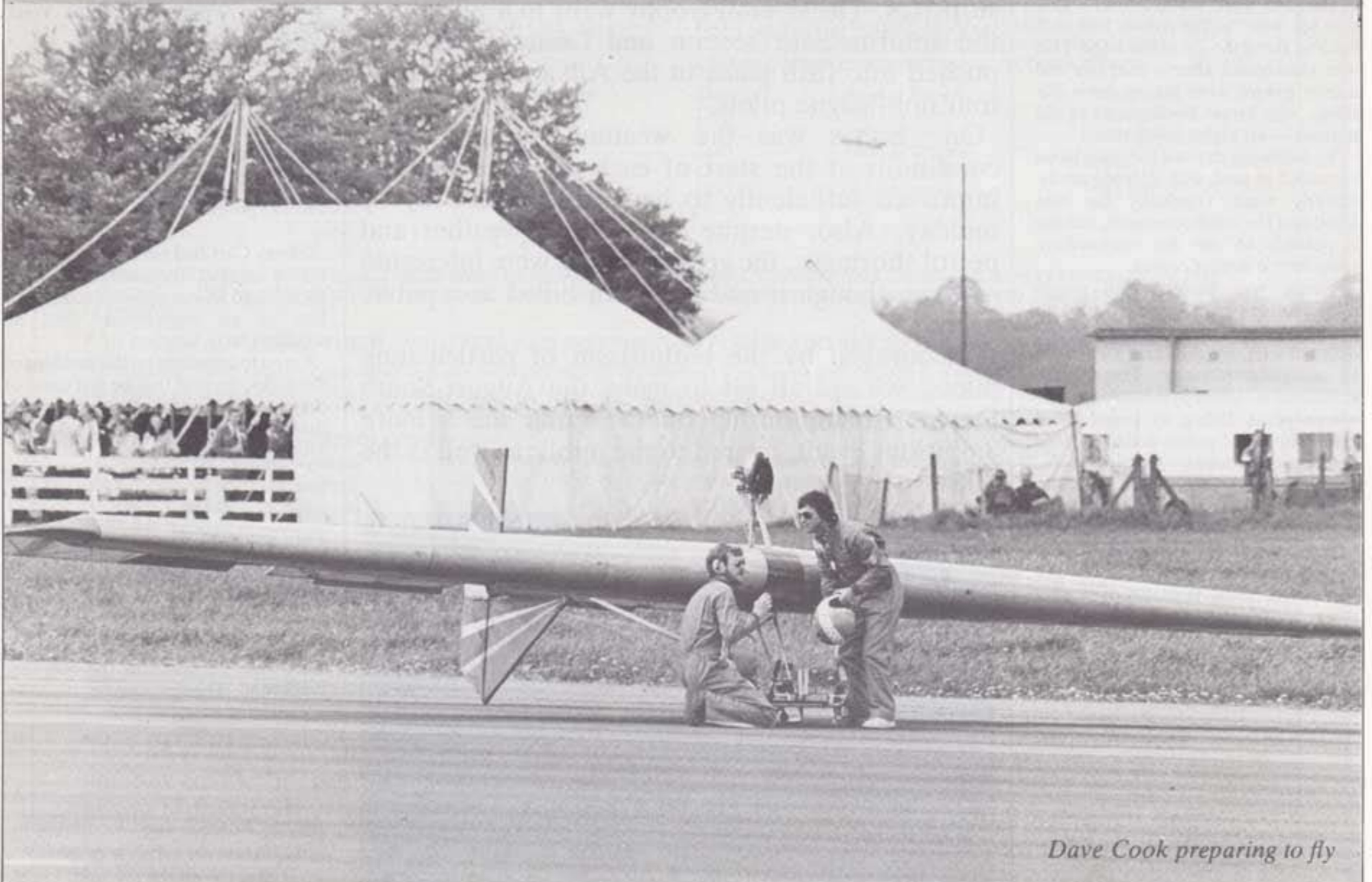
Doing an air show is difficult because one flies at an allotted time and not when conditions are most suitable. Without take-off and landing wind it is difficult to make an impact on the crowd when no error is permitted.

The final day of the show brought dreadful flying conditions. Heavy and continuous rain, cloud at 200ft. and visibility of a quarter of a mile . . . We parked at the mouth of our hangar and awaited the slot times. No one was flying. I was eighth from the start and when the slot time came, we wheeled out on to the threshold, getting wetter by the second.

The VJ 23 lifted off and I droned around for the allocated eight minutes and did out bit for the poor drowned crowd. It was my delight to rag the Air Force, Army and Navy pilots afterwards that we civvy pilots are the ones who really 'cut it' and that I was the Biggin Hill Air Display!

In fact a few other brave souls did fly that day, but it was really a washout.

In the air at Biggin Hill.



Dave Cook preparing to fly

THE STEYNING OPEN 1979

By Jeannie Knight

I have always believed that too little is provided for the intermediate pilot and when the entries started flowing in for the Steyning Open it was even more evident. We closed the Entries at 60, and from those we had only 16 for the advanced section — the remainder were all intermediate pilots.

The event was a very tentative step into the unknown. We wanted to provide something that flyers would enjoy, with interesting tasks, and to show that Steyning Bowl has good potential as a site. At the same time, by force of circumstances we were operating on a breathless shoe-string of time and money.

Free-flying proved that Steyning Bowl *can* be soared and the very high standard of intermediate flying was a pleasure to watch. Our largest expenditure was having a full St. John Ambulance Brigade service on site both days. The biggest gratification was in seeing their facilities entirely unused!

The competition opened with the advanced section on Saturday competing in a north-easterly. Conditions were soarable and a task was set with mirror pylons and spot landing along the top of the ridge. This was abandoned after a trial run and mirror pylons were set up down the slope, with target landing area in the bottom — all flights being timed.

The following day saw Steyning Bowl shrouded in mist, with a strong north-easterly wind. Gradually the mist lifted and the wind decreased, making it possible to run the intermediate tasks over a similar course.

Scoring was simple, with points allocated for clearing pylons, stand up landings, target area landings. In the event of a tie, the time taken was used to ascertain placings. There were variations with foul pylons in one task, where pilots failing to round them successfully had points deducted from their previous score.

The Johnny Carr Disco was the highlight of Saturday, with a large turnout and an evening enjoyed by all who went. The draw was made for the raffle and prizes went as follows: £10 first prize, John Whitehead; second prize of whisky, John Whitehead; third prize of wine, John Hewitt. Murray Rose of Chargus made the draw.



The 1979 Steyning Open Championship held on June 2nd and 3rd brought some unexpected surprises. The overall trophy went to a pilot from the Intermediate section and Lester Cruse was pushed into fifth place in the Advanced group by four non-league pilots.

One bonus was the weather. Despite poor conditions at the start of each day, the weather improved sufficiently to have tasks underway by midday. Also, despite dull, damp weather and petrol shortages, the general public were interested — even though it had not been billed as a public event.

Encouraged by the enthusiasm of participating pilots, we are all set to make the August South Downs Championship on the same site a more ambitious event, geared to the public as well as the pilot.



Competition trophies were presented on Sunday afternoon, with the Johnny Carr trophy for overall winner going to Martin Powell of Horley, who has been flying for a year. Trophies were awarded to first three placings in each section and main results were as follows:

Advanced section:

- 1, Peter Banner, Wimbledon, Super Scorpion, 150 points.
- 2, Jim Payne, London, Super Scorpion, 150 points.
- 3, David Batter, Westcliffe on Sea, Eagle, 140 points.
- 4, Andy Smith, Bexley, Super Scorpion, 140 points.
- 5, Lester Cruse, Coulsdon, Cherokee, 130 points.
- 6, Peter Banks, Dorking, Cherokee, 130 points.
- 7, Martin Brady, Horsham, Wills XC, 130 points.

Intermediate section

- 1, Martin Powell, Horley, Spectrum, 170 points.
- 2, Dave Bowman, London, Sunspot, 170 points.
- 3, Dave Wood, Haverford West, Vortex, 170 points.
- 4, John Whitehead, Brighton, Super Scorpion, 160 points.
- 5, Joe Anderson, Rustington, Vortex, 140 points.
- 6, Paul Green, Croydon, Super Scorpion, 140 points.
- 7, Mike Lingard, Caterham, Falcon IV, 140 points.

Johnny Carr had fun testing his flying ability against competitors in each section and we ran a private scoring for him as an experiment. (No, he wouldn't have won!).

Asked to comment on the standard of the tasks, he said that he felt some of them were better than league tasks and that this was certainly no Mickey Mouse contest.

A special mention goes to Natalie Wilson, who came 15th in the Intermediate section with 100 points, and Geraldine Brady, who was 20th with 70 points. Keep trying, girls!

A pleasing finish to the entire event was that preliminary accounts show that we made a small profit of just over £200 on the event, raffle and disco. A much needed boost to the Steyning Bowl fund. Thanks.

Martin Powell, overall champion, lands inside the target area on his final flight to clinch the title.



Peter Banner, winner of the Advanced section, receives his trophy from Jeannie Knight.



Murray Rose of Chargus draws out raffle winners at the Johnny Carr Disco, with Johnny Carr and Jeannie Knight helping.

INSURANCE

NEW INSURANCE RATES

THE FOLLOWING INSURANCES ARE THE NEW RATES, EFFECTIVE 1st MAY 1979, ALL PLACED AT LLOYD'S AND APPLICABLE TO UNITED KINGDOM BASED BHGA MEMBERS – AND ARE EFFECTIVE THROUGHOUT EUROPE

PERSONAL ACCIDENT BENEFITS IN THE EVENT OF A HANG GLIDING ACCIDENT

CAPITAL SUM

IN EVENT OF DEATH, LOSS OF EYE/LIMB (OR USE THEREOF) OR PERMANENT TOTAL DISABLEMENT

Code	Capital Sum Benefit	Premium
A2	£ 2,000	£ 4.00
A3	£ 3,000	£ 6.00
A4	£ 4,000	£ 8.00
A5	£ 5,000	£10.00
A6	£ 6,000	£12.00
A10	£10,000	£30.00
A15	£15,000	£60.00
A20	£20,000	£80.00

WEEKLY BENEFIT

PAID UP TO 104 WEEKS (EXCLUDING FIRST 14 DAYS) FOR SO LONG AS DOCTOR CERTIFIES YOU TOTALLY UNABLE TO FOLLOW NORMAL OCCUPATION

Code	Weekly Benefit	Premium
D20	£20 per week	£12.00
D30	£30 per week	£18.00
D40	£40 per week	£24.00
D50	£50 per week	£30.00
D60	£60 per week	£36.00

FOR COMPETITION PILOTS *i.e.* THOSE WHO TAKE PART IN NATIONAL OR INTERNATIONAL COMPETITIONS OR IN THE LEAGUE —, OR IN ANY COMPETITIONS ABOVE CLUB LEVEL, UNDERWRITERS HAVE INSISTED ON THE ABOVE RATES PLUS 25%

FOR MANUFACTURERS, THEIR EMPLOYEES AND INSTRUCTORS PLEASE ADD 50% TO THE ABOVE PREMIUMS

No Proposal Form required, provided you are between 16 and 65, warrant you are fit and declare any serious accidents or illnesses during past five years, we can normally give cover immediately we receive your NAME, ADDRESS, AGE, OCCUPATION, GLIDER DETAILS, BHGA OR CLUB MEMBERSHIP NUMBER AND CHEQUE.

GLIDER ALL RISKS (GROUND) COVER

Policy excludes Flight Accidents but covers every accidental ground risk that we have yet thought of, e.g. Theft, Damage resulting from Car Accident, etc. (Excluding first £5.00 each claim). Includes 30 days in Europe each year.

GLIDER VALUE	£300	PREMIUM	£8.00	GLIDER VALUE	£400	PREMIUM	£10.00
GLIDER VALUE	£350	PREMIUM	£9.00	GLIDER VALUE	£450	PREMIUM	£11.00

EACH ADDITIONAL £50 VALUE — ADD £1.00 PREMIUM

RATES FOR CLUBS, MANUFACTURERS, SYNDICATES AND WORLDWIDE COVER ON APPLICATION

LIFE & ENDOWMENT & HOUSE PURCHASE ASSURANCE

There need be no Premium loading to cover the Hang Gliding Risk. We have arranged Special terms for BHGA Members. Please outline your requirements.

CLUB LIABILITY POLICY

The BHGA Master Policy provides £500,000 Public Liability Cover for all Clubs, their Officers, Committee Members, Members, Wives, Girl-friends, Associate Members — and does meet all notified National Trust, Landowner and Local Authority requirements. That cover is valid throughout Europe.

NOTE NONE OF THE ABOVE COVERS THE TOWING OR MOTORISED HANG GLIDER RISK. QUOTATIONS FOR THOSE RISKS WILL HOWEVER BE GIVEN IF YOU WILL SEND DETAILS.

HOLIDAY COVER — INCLUDING THE HANG GLIDING RISK — DETAILS ON APPLICATION.

REGGIE SPOONER INSURANCE BROKER FOR THE BHGA, CLIFTON HOUSE, BATH RD., COWES, I.O.W. PO31 7RH.
TELEPHONE: (0983 292305)



CLUBMAN'S MERE 1979

The annual BHGA members' event at Mere will be held on September 7th (practice day), 8th and 9th.

Last year's event was enjoyed so much by the ordinary flyer that we are developing the theme further this year to make it into a Clubman's competition (of if you must, a Clubperson's competition). The relaxed style of last year will be retained.

Everyone come along. The manufacturers will be there with displays and shops and there will be a second-hand glider mart, catering and all other facilities. Once again we will be able to camp/caravan on site.

There will be three events. You can enter for all or any one of them on arrival.

1. Cross country This event will be open continuously over the three days. Remember to bring your own recovery crew!

2. Daily distance knock-out contests with the Clubman's Distance Tankard for the winner.

3. A timed precision event for:

- (a) The Clubman's Cup.
- (b) The Club Team Shield.

In the third event, members can enter as individuals if they want to — in which case they will be competing for the cup, which will be awarded to the top flyer in the class.

Alternatively they can also enter as part of a team. A team will consist of not less than four and not more than six pilots who have been members of the club they represent for at least six months. As well as retaining individual scores for the Cup, nominated team flyers will also have their scores added collectively to their team scores to compete for the Club Team Shield.

This particular event will be held over Saturday 8th and Sunday 9th September. Entries for all events can be made on arrival. Entry fee will be £4, which covers entry into all events and all competitors will receive a commemorative badge.

Full facilities will not be available on site until Friday evening.

Will League pilots be able to enter? Yes, of course they will. Now is your chance to show them that they are not as hot as they think they are . . .

Old Uncle Bob will once again be chief marshall (a couple of barley wines might get you a good score!). If you are prepared to assist with marshalling, please drop him a line at 83 Wern Road, Skewn, West Glamorgan., stating whether or not you can arrive on Thursday evening.

General helpers are also needed. If you are willing to lend a hand, to lift and carry, please contact Percy Moss, 40 Moseley Road, Kenilworth, Warwicks.

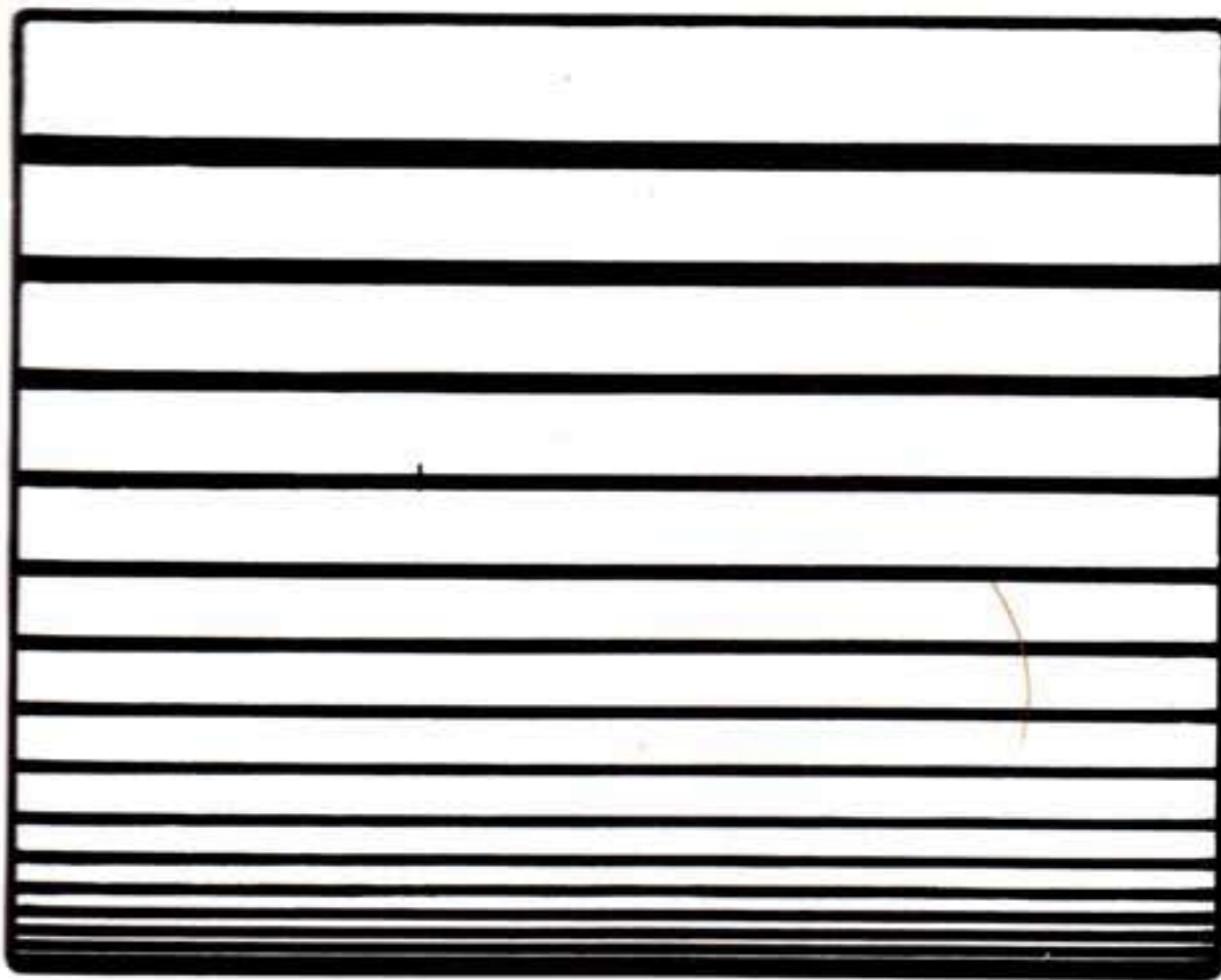
Accommodation: Members with caravans can go to the camp-site at Wincanton Race Course. A camp-site with full camping facilities is available at Dr. Hart's site at the eastern end of the Mere by-pass. Book by letter to Dr. Hart, Willeybrook, Ashwell, Mere, or telephone Mere 697.

For details of guest houses, bed and breakfast and hotel accommodation in the Mere area, send 25p (stamps or postal order) and a large stamped addressed envelope to Salisbury District Tourism Information Centre, The Square, Mere, Warminster, Wilts. Telephone Mere 341.

Camping on site will have minimal facilities, so those with children may wish to use one of the alternative areas listed above.

See you all at Clubman's Mere 1979.

PERCY MOSS



'G' FORCE

by Dunstan Hadley

The beginner, firmly gripping his hang glider, stands, motionless, poised, ready for take off, on his first flight. He is obeying Newton's first law of motion which states that:

'A body at rest remains at rest until some force acts on it to cause it to move.'

The moment for take off arrives, he contracts his muscles and starts to run. As he runs, he accelerates smoothly forwards. He is demonstrating Newton's second law of motion which states that:

'A body moves, and accelerates, when a force is applied to it, in the direction in which the force is applied, and with a speed depending on the force.'

As his feet leave the ground and his eyes glaze in wonder, his muscles freeze into immobility and he hangs rigidly below his glider. If the glider is stable, and the weather calm, he now glides down under the influence of gravity, modified by the air flowing over his wing, demonstrating again Newton's first law, which also says that:

'A body in uniform motion will remain in uniform motion, unless some force acts upon it to change it.'

Proceeding on his way he continues towards the ground, until, when he is still just above it, the nose of the glider strikes a bush, and, after penetrating about two feet, comes to rest. This represents a negative acceleration, or deceleration, from 15 m p h to zero in two feet. The glider has demonstrated Newton's third law of motion, which states that:

'When one body strikes another body there is an equal and opposite reaction.'

This equal and opposite reaction acting on the glider to slow it means that the pilot, now demonstrating inertia, will accelerate relative to the glider until he strikes the control bar, bending it six inches out of line. He has decelerated from 15 mph to Zero in two feet six inches. His stomach, loosely anchored inside his abdomen, will continue for another few inches, until it is brought to rest against the underneath of his diaphragm. The pint of beer he had for lunch now leaves the floor of his stomach and breaks against the roof in a cloud of foam. The glider, the pilot and his tissues and any fluid they contain such as beer or blood are now completely at rest. What has happened to all that energy? Energy cannot be created or destroyed only transformed into another variety. It has gone to heating the bush, the glider and the air, and noise such as breaking wood and bending metal. Added to, no doubt, by a few words from the pilot.

The flight demonstrated how acceleration in a straight line can affect the hang glider pilot. Should a pilot flying at 2,000 feet become detached from his glider gravity will exert a more direct effect. The pilot then falls straight towards the centre of the Earth. In the first second he falls 16 feet, in the second second 32 feet, in the third 64 feet in the fourth 96 feet. After the first second he falls an extra 32 feet for each second that he falls, or, an extra 32 feet per second increase in speed for every second of time he is falling. Written as $32'/\text{sec}/\text{sec}$ or $32/\text{sec}^2$. This continues until the equal and

opposite reaction of air resistance causes equilibrium to be established, after about six and a half seconds of free fall. The pilot will have fallen 672 feet and reached a speed of 176 feet a second or 120 mph. This is an acceleration of 1G and is due to the constant pull exerted by the Earth's gravity on any object which is falling. If the pilot now opens a parachute his speed will decrease from about 176 feet a second to about 23 feet a second in the three seconds that it takes the parachute to open. This will expose him to a deceleration of about 17G for 0.3 seconds at the end of the third second. All these forces may be measured and expressed in terms of weight.

Accelerations therefore results in changes of weight or alternatively in multiples of the standard gravitational acceleration of 1G or 32 feet per second per second ($32.2 \text{ feet}/\text{sec}^2$ is more accurate). Weight = mass x G.

$$10 \text{ lb} = 10 \text{ lb} \times 1G$$

$$20 \text{ lb} = 10 \text{ lb} \times 2G$$

For 0.3 of a second, therefore, the pilot is about 17 times heavier as his parachute opens. The body can withstand about 25G without injury, sometimes more, providing that the force does not come on too rapidly. The limit is a *rate of application* of about 300G a second (an acceleration of $300 \times 32.2 = 9660 \text{ ft}/\text{sec}^2$ for one second) known as the "Jolt", which of course must last for less than 0.1 of a second if more than a total of 30G, and injury, is to be avoided.

EFFECT OF SPEED

Speed describes a rate of change of position, and the examples already described show that changes in speed alone can produce accelerations in a straight line. Speed together with direction is velocity, and a change of direction, even without a change of speed, also produces an acceleration. This can be explained as follows:

A bullet fired parallel to the Earth's surface falls towards it at $32 \text{ feet}/\text{sec}^2$, just as will a stone dropped from the hand. However if the bullet travels fast enough, because the surface of the Earth is curved, it will curve downwards away from the falling bullet as fast as the bullet is falling. The bullet is continually falling towards the surface of the Earth but never getting any closer, and will thus be in orbit. This can only happen above the atmosphere where there is no resistance from the air to slow the bullet. The minimum speed necessary would be about 18,000 mph.

In the same way a stone on a string held in the hand and whirled round the head, continuously accelerates towards the head, without getting any closer. There is an acceleration, or centripetal force, acting along the line to the head. An opposite force, the centrifugal force is trying to hurl the stone off the end of the string. In the same way the pilot of a hang glider flying in a curved path, as when recovering from a dive, or in a turn, accelerates towards the centre of the turn. There is a centripetal force pulling the wing inwards towards the centre, and a centrifugal force trying to throw the pilot, suspended by his harness, outwards. The centrifugal force increases the pilots apparent weight, and also the apparent weight of the glider. The steeper the turn, and the faster the glider is flying, the greater the apparent increase in weight will be.

A person standing on the Earth's surface is being pulled towards the centre of the Earth with a force of 1G. If the person stands on scales, the force is recorded as his weight. When flying in a curved path therefore, if the weight of the glider pilot is twice his normal weight he is under the force of 2G, which has been generated by the curved flight path. This happens in a 60° banked turn.

The effect that G has on his body depends on how much G is being experienced, and for how long, and in which direction it is acting on the body. The head to feet G felt in the seated position in a turn, or recovering from a dive, is known as positive or + Gz. G felt from feet to head would be negative or - Gz. Z indicates that the force acts along the head to feet axis. In the prone position, during a turn, the G is - Gx and supine + Gx. X being the relevant axis in the prone or supine positions.

In the seated position a pilot usually starts to black out at about + 3G, because the blood is pulled out of his eye balls. He can stand about + 5G for 5 seconds, after which the blood draining out of his brain causes him to become unconscious. Because the height of the column of blood is less in the prone position than the seated position a prone pilot could withstand more G than a seated pilot, without becoming unconscious. However, he could probably not hold up his unsupported head above 3G, when it would be three times as heavy. Also blood being forced into the eyeballs causes a red mist to form in the pilots vision, known as "redding out". In this respect the seated pilot is better off.

To give some idea of the magnitude of the G forces felt during life: A pilot flying straight in very turbulent conditions is unlikely to experience forces greater than + 2G or less than 0G, weightlessness, although -2G is not impossible. This would be uncomfortable and would throw the pilot up to the keel boom and down again. These excursions are however short acting, so that blacking out or unconsciousness would not occur, unless the pilot hits his head hard on the glider and is concussed.

Should the glider be put into a violent manoeuvre there may be "jolt" forces. Jolts of 10G to 20G, may be sufficient to cause structural damage to the glider. A 75° banked turn puts about 4.4G on the glider.

A person jumping from a table to the floor may feel about 12G briefly.

The amount of G which the glider will withstand varies with the glider and the direction in which the G is applied. Most aircraft withstand + G better than - G. The average Rogallo type glider will usually take about + 5G sometimes more, sometimes less. A ham fisted pilot can exceed this.

There is one other type of acceleration. This occurs when change of speed and direction take place together. This is not measured in G but in degrees of roll per second. It only occurs in spiral type movements, such as may occur in a spin, and the axis usually passes close to, or through, the body of the pilot. Its effect on the body is to cause vertigo. The effect on the glider may be to cause structural damage, as of course will any acceleration if the amount of G the glider will withstand is exceeded.

HOW MUCH 'G'?

For those of you who would like to calculate the amount of G which may be felt continue reading. Consider first that the force of gravity causes bodies to move towards each other. When one of the bodies is a brick and the other is the Earth, most of the movement is made by the brick, the movement of the Earth is too small to measure. The speed with which the brick approaches the Earth depends on mutual attraction between it and the Earth, and on its mass and weight. Its weight depends on how far away from the Earth it starts, because the force of gravity decreases with distance. Its mass will stay the same, so that it will require the same force to move it, regardless of its distance from the Earth. If the brick was falling on the Moon its weight, as measured by a spring balance, would be only about one sixth of its Earth weight. Measured on a beam balance its mass would be the same as on Earth. All this can be expressed quite simply as:

Force = mass X acceleration.

$$F = ma \quad \text{Formula 1}$$

Force is measured in lbs weight

Mass is measured in Slugs

$$1 \text{ Slug} = 32.2 \text{ lbs}$$

Acceleration is measured in Feet/sec/sec

In other words

A force of 32.2lbs weight (gravity) acting on a mass of 1 Slug (32.2lbs) causes it to accelerate at 32.2 Feet/sec² or 1G.

A man weighing 151 lbs jumps off a diving board.

$$151/32.2 = 5 \text{ Slugs}$$

$$151 \text{ lbs wt} = 5 \text{ Slugs} \times a$$

Force mass acceleration

$$a = 151/5$$

$$= 32.2 \text{ Feet/sec}^2$$

$$= 1G$$

In order to obtain the information necessary to find out the G sustained by the hang glider hitting the bush more calculation is necessary. While moving at a uniform velocity -

Distance covered = velocity x time

$$S \text{ (feet)} = u \text{ (FT/sec)} \times t \text{ (seconds)}$$

$$S = ut \quad \text{Formula 2}$$

When acceleration takes place.

Final velocity = initial velocity + acceleration x time

$$v \text{ (Ft/sec)} = u \text{ (Ft/sec)} + a \text{ (Ft/sec}^2) \times t \text{ (seconds)}$$

$$v = u + at \quad \text{Formula 3}$$

or

Distance covered = Average velocity x time.

$$s = \left(\frac{v + u}{2} \right) \times t$$

But in Formula 3 $v = u + at$

$$\text{So } s = \left(\frac{u + at + u}{2} \right) \times t$$

$$\text{or } s = Ut + \frac{1}{2} at^2 \quad \text{Formula 4}$$

Starting again with $v = u + at$

$$t = \frac{v - u}{a}$$

So that if in the equation

$$s = \frac{v + u}{2} \times t$$

t is replaced by $\frac{v - u}{a}$

$$\text{then } s = \frac{(v + u)(v - u)}{2a}$$

$$s = \frac{v^2 - u^2}{2a}$$

$$\text{or } v^2 = u^2 + 2as \quad \text{Formula 5}$$

It is now possible to calculate the answer. The hang glider decelerates from initial velocity $u = 15 \text{ mph} = 22 \text{ Ft/sec}$ to final velocity $v = \text{zero Ft/sec}$ over a distance $S = 2 \text{ ft}$.

Using Formula 5

$$\begin{aligned} \text{Final velocity } v^2 &= 0 = u^2 + 2as \\ &= 22 \times 22 + 2a \times 2 \\ &= 484 + 4a \\ a &= -\frac{484}{4} \\ &= -121 \text{ Ft/sec}^2 \\ &= \frac{-121}{32.2} \\ &= -3.75 G \end{aligned}$$

- G because this is a deceleration as the glider slows down after the nose hit the bush.

The pilot travelled 2 ft 6 inches.

$$\begin{aligned} \text{So } v^2 &= 0 = 22^2 + 2a \times 2.5 \\ &= -\frac{484}{5} \\ &= -96.8 \text{ ft/sec}^2 \\ &= -3.06 G. \end{aligned}$$

Now using the other formula $v = u + at$

$$0 = 22 - 121 t$$

$$121t = 22$$

$$t = 0.17 \text{ seconds}$$

Which is the length of time it took the glider to slow from 15 mph to stop.

and for the pilot:

$$0 = 22 - 96.8 t$$

$$96.8t = 22$$

$$t = 0.22 \text{ seconds}$$

Because of the give in the bent control bar the pilot experiences less G as he has more time in which to slow down, 0.05 seconds.

Going a step further the glider has been subjected to -3.75 G for 0.17 seconds. So that if the deceleration had lasted for a whole second at this force the G would be -

$$\begin{aligned} &\frac{-3.75}{0.17} G \\ &= -22.06 G \end{aligned}$$

Which means that the rate of application of G is -22.06 G per second. As it is only experienced for 0.17 seconds the total force on the glider is only -3.75 G

In the case of the pilot

$$\frac{-3.06}{0.22} G$$

$$= -13.91 G \text{ per second rate of application.}$$

This is below the level at which injury would be expected to occur, apart from a bruise. Your crash helmet, if it conforms to British standards 5631 or 2495 will withstand a rate of application of $\pm 400G/\text{sec}$. The deformation of the control bar helps to prevent injury in the event of a crash.

RADIAL ACCELERATION

The next aspect to consider is radial acceleration, the force acting during a curved flight path. Acceleration towards the centre of a turn, the centripetal acceleration is calculated from the formula:-

$$\text{Centripetal acceleration} = \frac{v^2}{r} \quad \text{Formula 6}$$

$v = \text{speed in Ft/sec}$

$r = \text{radius of the turn in Ft.}$

For example a glider flying at 30 mph is moving at 44ft/sec

If it flies in a turn of radius 30 ft the

$$\begin{aligned} \text{Centripetal acceleration} &= \frac{44 \times 44}{30} \\ &= 64.5 \text{ ft/sec}^2 \\ &= \frac{64.5}{32.2} \\ &= 2G \end{aligned}$$

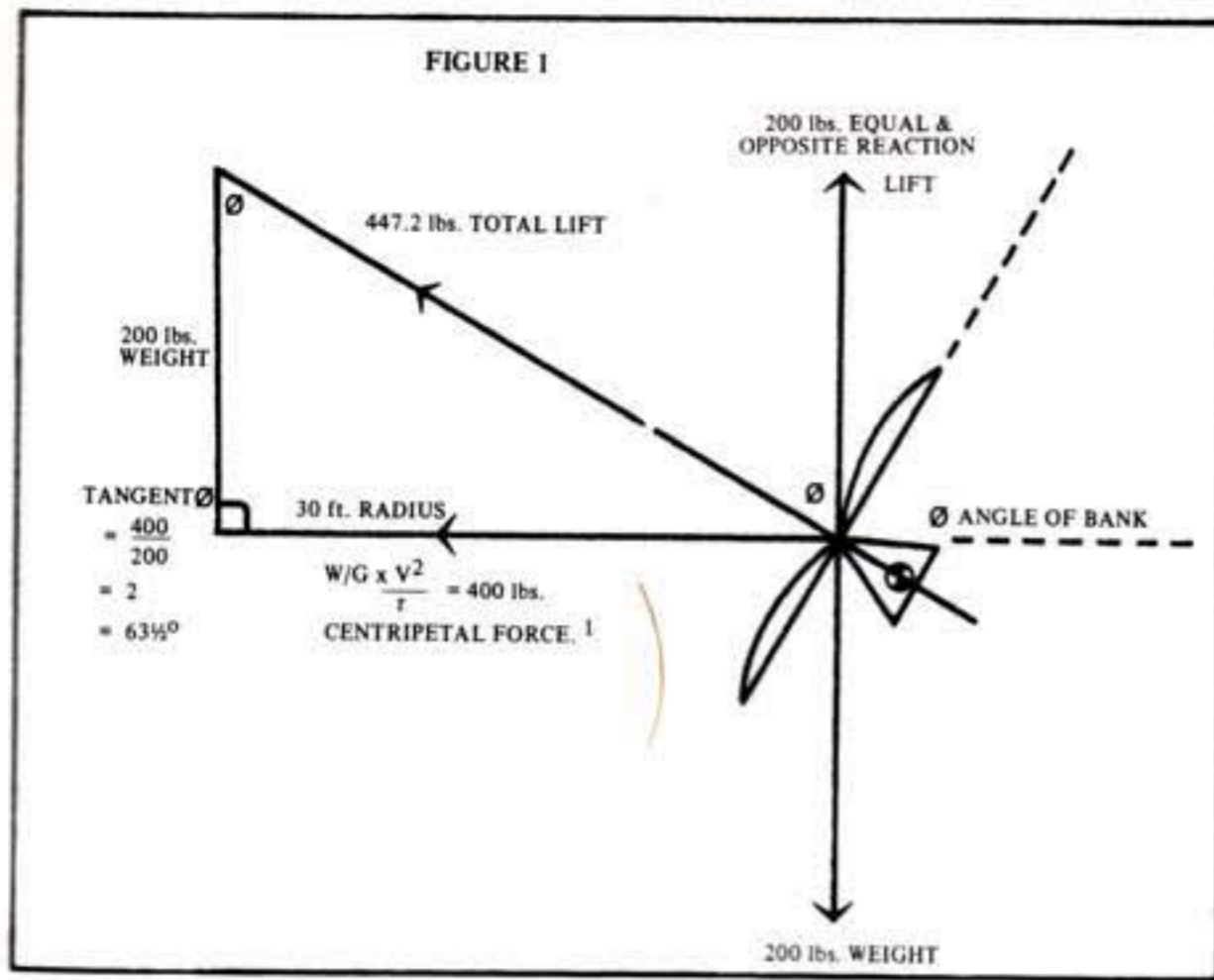
If the glider weighs 50 lbs and the pilot 150 lbs.

The mass therefore is 200 lbs.

$$\frac{200 \text{ lbs}}{32.2} = 6.21 \text{ Slugs}$$

The actual force holding the glider in its turn therefore, the centripetal force, can now be calculated

$$\begin{aligned} \text{Centripetal force} &= \text{mass} \times \text{centripetal acceleration} \\ &= m \times v^2/r \quad \text{Formula 7} \\ &= 6.21 \times 2 \\ &= 12.42 \text{ Slugs} \\ &= 400 \text{ lbs.} \end{aligned}$$



The diagram represents the glider being banked in an accurately flown turn, with no slip or skid. The weight of the glider needs an equal and opposite reaction to hold it up. This comes partly from the component of lift, acting vertically upwards, and partly from the component acting towards the centre of the turn, the centripetal force. The amount of each depends upon the rate of turn and speed of the glider, and the angle of bank. A model aircraft on a control line could "fly" without any wings if the engine were powerful enough to make it go fast enough, just like the stone on the string.

The banked wing creates lift, which acts at right angles to it (approximately along the line of the king post) and the total lift can be worked out by Pythagoras' theorem. The square on the hypotenuse is equal to the sum of the squares on the other two sides. Who ever thought that flying a hang glider would come to this?

$$\sqrt{400^2 + 200^2} = 447.2 \text{ lbs}$$

The angle marked θ in the corner of the triangle is the same as the angle of bank.

The tangent of this angle

$$\begin{aligned} \tan \theta &= \frac{400}{200} \\ &= 2 \\ &= 63\frac{1}{2}^\circ \end{aligned}$$

This therefore is also the angle of bank.

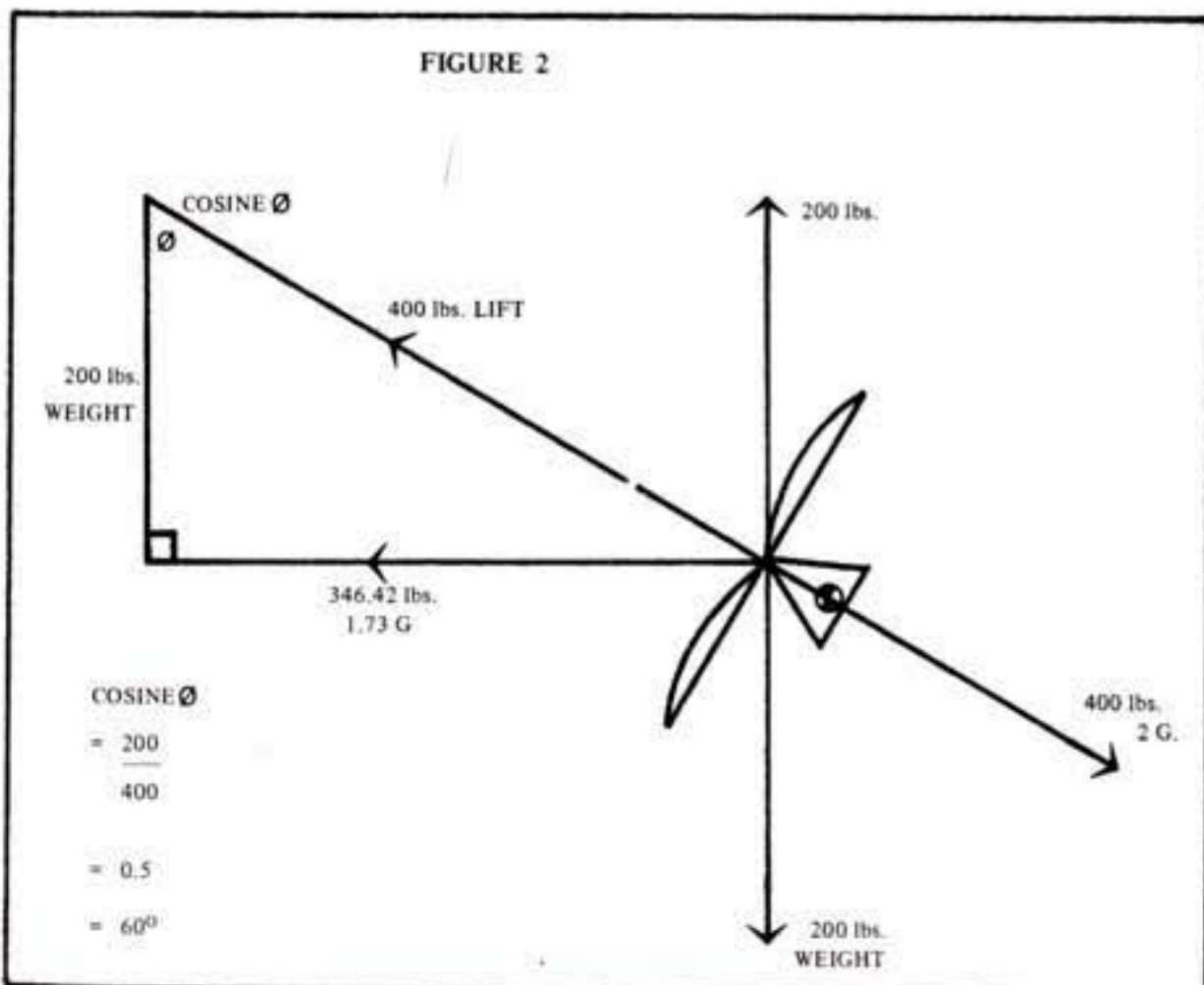
$$\tan \theta = \frac{\text{centripetal force}}{\text{weight}}$$

The tangent of the angle of bank

$$\equiv \frac{mv^2/r}{w}$$

The angle θ therefore is the correct angle of bank for any turn of radius r for an aircraft (or even a bicycle) travelling at a velocity of v ft/sec.

Look at a slightly different triangle



$$\text{The cosine of } \theta = \frac{200}{400} = 0.5 = 60^\circ$$

The lift required is twice the weight of the glider so this is a 2G turn. The centripetal acceleration now is only 1.73G. These figures are constant relationships. A 60° turn always imposes 2G on the aircraft.

Some more examples are:—

$$\begin{aligned} 70\frac{1}{2}^\circ \text{ angle of bank} &= 3G \\ 75\frac{1}{2}^\circ \text{ angle of bank} &= 4G \\ 84\frac{1}{4}^\circ \text{ angle of bank} &= 10G \end{aligned}$$

This is only true of accurately made turns. The pilot who flies a hang glider at steep angles of bank will usually slip out of the turn as the bank is increased, unless he lowers the nose to steepen the glide, most often some of each.

The stalling speed of the aircraft in a turn, or recovering from a dive, varies as the square root of the load on the wing, multiplied by the normal stalling speed of the glider. Assume that the normal stalling speed in straight flight is 15 mph. In a 60° banked turn the load is 2G.

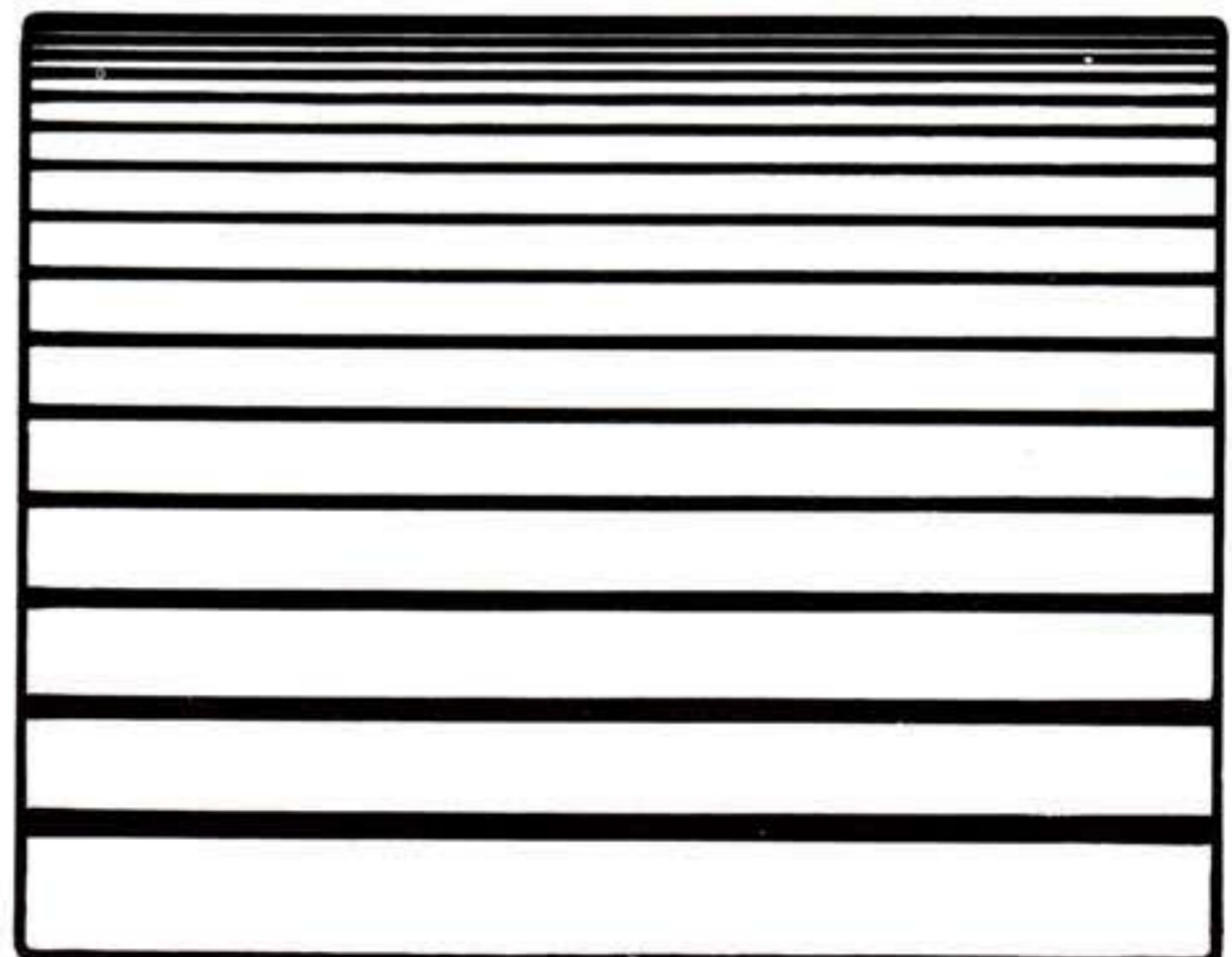
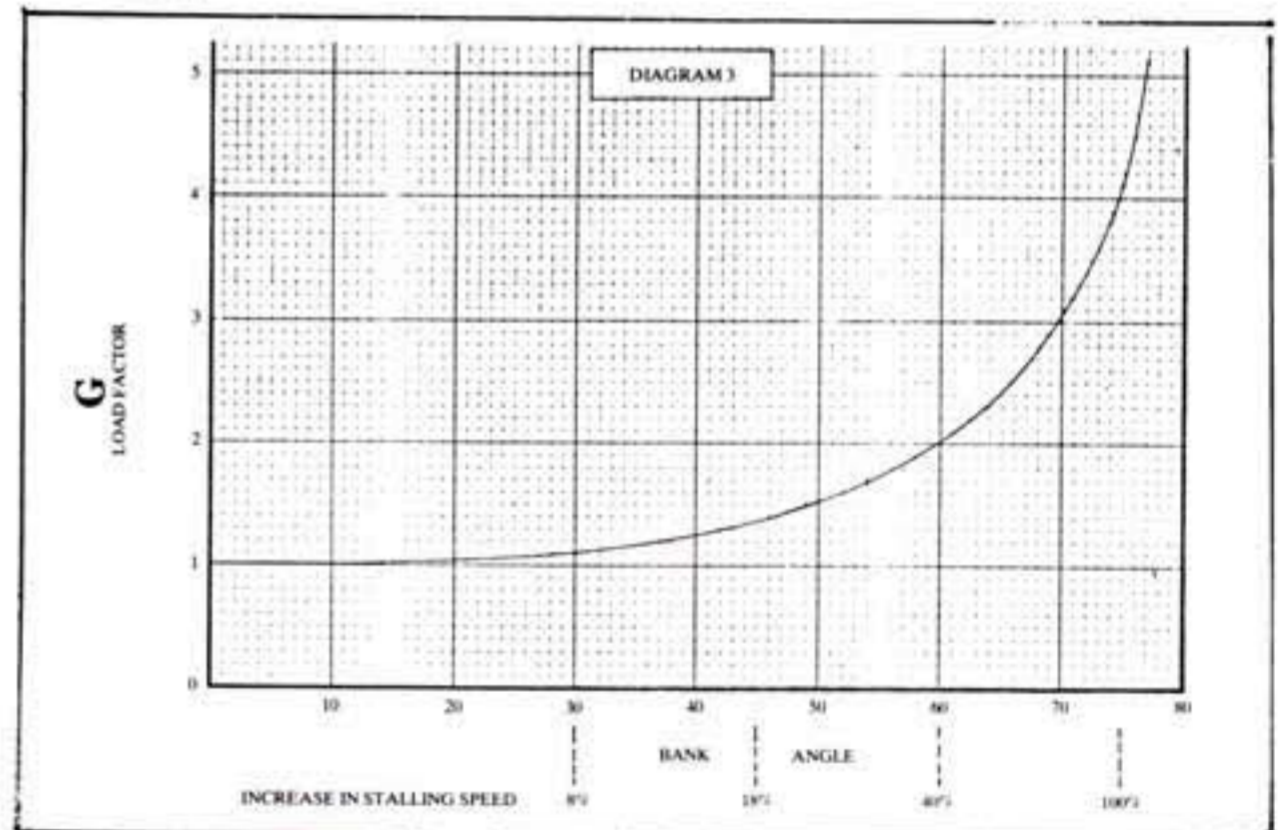
$$2 \times 15 = 21.2 \text{ mph.}$$

Some other figures are:—

$$\begin{aligned} 30^\circ \text{ banked turn} &\doteq 1.1G = 15.7 \text{ mph}^\circ \text{ stalling speed} \\ 70\frac{1}{2}^\circ \text{ banked turn} &= 3G = 26 \text{ mph}^\circ \text{ stalling speed} \\ 75\frac{1}{2}^\circ \text{ banked turn} &= 4G = 30 \text{ mph}^\circ \text{ stalling speed} \\ 84\frac{1}{4}^\circ \text{ banked turn} &= 10G = 47.4 \text{ mph}^\circ \text{ stalling speed} \end{aligned}$$

It can be seen therefore that G is of considerable importance to the hang glider pilot.

It should be remembered therefore to increase speed before entering a turn by an adequate amount, and to keep the speed on during the turn. A pilot who starts a turn without sufficient speed is liable to stall the inside wing as soon as he starts the turn. Pushing the bar out to maintain an accurate turn is essential but if the turn is tightened too much the decrease in the radius of the turn increases the centripetal force, and therefore the load on the wing. This may push the stalling speed higher than the speed of the glider and it will stall.



MORE ON TOW LAUNCHING

BY PAUL BAKER

Tow launching is how modern hang gliding started. In 1962 John Dickenson, an Australian water skier started towing rogals instead of flat kites and introduced them to Moyes and Bennett. Richard Miller's 'Bamboo Butterfly' did not appear until 1964. In 1969 Moyes towed to 2,870ft. He also foot launched and soared for 32 minutes that year. It is clear that towing played a considerable part in the early development of hang gliding. However, this initial towing was an off-shoot of water skiing and so was done over water with its greater inherent safety.

The problems started in the early '70s when as the interest and enthusiasm increased, people with little knowledge starting towing foot launched gliders which were larger and weaker, with anything (car, boat, beach buggy, snow mobile etc.) over any terrain. However, in a few places (i.e. Florida and Australia) they have continued to tow launch successfully all this time. They accept certain limitations and procedures and they have reduced the risks and dangers to a very acceptable level. In Florida, where all the flying is tow launched, the accident record appears to be considerably better than average for the States as a whole when almost all the rest of the flying in the States is foot launched!

FIXED LINE TOWING

Until recently all towing has been done on a fixed line and this demands considerable restrictions and limitations.

(a) An experienced 'pin man' is essential. He is much more important than the pilot. He watches the glider every second of the tow, controls the speed of the boat (and so the climb rate of the glider) and is always prepared to operate the quick release on the bottom of the tow line if necessary and possible. Ideally the driver just steers but if he has to control the throttle he does so following the 'pin man's' instructions exactly.

(b) The tow is always done over water. On a fixed line things do go wrong occasionally, and water is a lot softer than the ground!

(c) The Glider, A-frame, releases, bridle, tow line etc. need to be strong enough to withstand the stresses that can be generated under tow. These can be considerably more than in free flight. The glider needs to have good directional stability and reasonable pitch damping. A V-bridle, with releases top and bottom of the A-frame, is essential (just one release on a 3-point bridle from the 3 corners of the A-frame is an unsatisfactory compromise in several situations).

"Gliders were breaking up, diving into the ground, tow lines were breaking. The basic problem was that most people did not know what they were doing, what was going on, what the problems were, and what safety factors were essential. All this led to tow launching being regarded as extremely dangerous in most parts of the world".

This was the situation several years ago. Paul Baker describes here the development of towing systems, including his experiences and development of a dynamic tow system.

Paul Baker's winch system.



(d) The air conditions must be stable and the winds light. In any other conditions the glider can get out of control extremely rapidly and the 'pin man' may not be able to do anything about it. Given that the conditions are not too extreme a skilled 'pin man' can sort out a lot of problems (or rather prevent them from happening). All that is required of the pilot is that he keeps the glider straight and has a basic knowledge of flying skills. In Florida the equivalent of our 'pilot's wings' is more than enough to tow safely. Recently using a payout winch with automatic line tension control they have started towing over the land without any problems.

NEW DEVELOPMENTS

We have spent 18 months researching and investigating towed launches, including visiting Florida where we acquired a 'Bennett Mountain'. We discovered that our theories were born out by what was being practised in the States. We have experimented with various methods of producing automatic line tension control (ALTC) and after a year of experimentation and several prototypes we are producing a payout winch with ALTC that maintains a very even line tension regardless of variations in speed of payout and the amount of line payed out. Using this winch we have safely towed

in greater range conditions than we would normally free fly in. Take-offs in light and variable (including some slightly downwind) are achieved in less than 4 paces with no undue effort or skill required by the pilot. The higher the wind speed, the easier the take-off. In high wind speeds with severe wind gradients the climb was very steady. The limitation factor was that a very slight forward ground speed on take-off became a very rapid (faster than max. airspeed of glider) backwards ground speed, still facing into wind at about 50ft.

Tows in very gusty conditions (the glider was being gust stalled flying back downwind after the release) still gave a very steady climb. In strongly thermic conditions with the glider being turned by lift under one wind, we were able to straighten the glider back into the line of tow without serious height loss. Our technique with the winch allows us to prevent 'lock outs' developing into serious problems. Overstressing the glider is prevented by the ALTC and we also use a weak link as an additional safety precaution.

We have done simulated line breaks at both the standard and the high tension setting and in both cases immediate pulling in on the bar prevented the glider from stalling. Our V-bridle with double top release prevents the

glider from climbing too steeply on take-off and until a safe height has been reached. The greatest height we have towed to so far is 1,800ft. and we expect to better 2,000ft. soon! I personally have thermal soared for over 30 minutes. I released at 1,600 and climbed to a max height of 2,800ft. using two different thermals.

DANGERS/RISKS

As in all flying, the danger is in hitting the ground hard. With hang gliding most accidents are collisions with the hill. In towing, there is no hill to fly into, and you are only near the ground on take-off and landing. Structural failure due to excessive tow line forces (caused by too fast a tow, strong gusts, thermal etc.) is one of the major dangers. ALTC copes with all these. The lock out is another. When the glider turns beyond a certain point from the direction of tow, the pilot's weight is insufficient to correct it and the glider goes into an accelerating sideslip. As soon as the tension is removed from the line the pilot can regain control. The winch operator prevents the lock out from developing into anything serious by relieving the line tension as necessary.

Given a skilled winch operator any 'pilot's wings' holder would have no problems with tow launching (if he does, he certainly should not have his 'wings!') Very light and strong winds should be avoided for the first tow. I feel that as all the pilot has to do is to keep the glider straight, and be able to make positive corrections. It will not require a lot more development before pilot 1 holders can tow under experienced supervision, in moderate conditions.

DEVELOPMENTS AND THE FUTURE

The re-emergence of towing will be of considerable benefit to all hang gliders. Safety will be increased in various fields. Manufacturers will be able to easily test fly production machines before sending them out. Testing and evaluating prototypes will be a lot easier and quicker. Clubs will be able to function far more effectively because they will be able to base themselves on one site, with clubhouse facilities, permanent instructors etc.

Flyers will be able to practice manoeuvres far more safely whether they are experts thermalling, competition flyers practising tasks, intermediates learning smooth co-ordination of turns, or beginners without an obstacle like a hill to fly into.

We feel that we have the possibilities with towing to remain in the lead in the hang gliding world with future developments.

A TOWING INCIDENT

BY PAUL BAKER



The day was going well. I had already been towed to 1500ft. on the Moyes. There were patches of lift around but I hadn't found one that took me up rather than just slowed my descent.

Since we were having no serious problems we decided to try towing Dave Garrison's glider. Having pre-flighted it, we attempted some hand towing to check that the bridle was satisfactory. There was insufficient wind to gain any height, but everything seemed in order, so we did some ground skimming with our automatic line tension payout winch set on a low tension. Again, all appeared satisfactory and it was time for a full tension tow.

On the first launch the glider started to turn off to the right as soon as it took off, so Chris (who was operating the ALT) let off the tension, but by the time Dave had the glider straight it was

almost back on the ground, so we aborted that attempt.

Next time, the glider started climbing fairly steeply and was drifting to the right. Chris let off the tension to allow Dave to straighten up. When it appeared straight the tension was put back on and the glider immediately pitched up and locked out to the right. (Photo 1).

Chris had to release the tension or the glider would have side-slipped into the ground in a lock out — but this left the nose of the glider up and the glider stalled, turning down wind (Photo 2). Here, note that Dave is not pulling in, so he does not have airspeed, so he cannot correct the turn and the glider stalled, turning downwind (Photo 2). Here, note that Dave is not pulling in, so he does not have airspeed, so he cannot correct the turn and the glider will continue to rotate.

Dave said he was too low to pull in and get the nose down because he would have dived into the ground. He prevented the nose of the glider from dropping through as it rotated, so he hit the runway at a fairly flat angle, still in prone with the control frame pushed fully out (Photo 3).

The packed parachute saved his chest and because he was on tarmac, everything slid nicely and the only damage was some 'road rash', and a bent leading edge. This is the only incident we have had in 18 months involvement with towing and we consider ourselves very fortunate to have had it.

It made us aware how things can go wrong in spite of taking very careful precautions and being well aware of the many problems of towing a hang glider. I hope our incident will make others think and ask themselves

whether they are truly aware of the problems they might encounter. If in doubt, they must follow the traditional towing procedure and *tow over water*.

My analysis of our incident is that there were various factors, as in all accidents.

1. The bridle system allowed the angle of attack to get too high under higher tension tow.
2. The pilot should have kept the glider straight.
3. When the lock out occurred, the tension should have been released gently so that the pilot could bring down the nose at the same time and so maintain airspeed, thus making the correction. Yet another example of the stall being a component of a hang gliding accident!

Photos by Mike Wisternoff

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REPORT ON TOWING ACCIDENT AT LITTLE RISSINGTON

EQUIPMENT

Estate car as tow vehicle
150ft. tow line fixed to car via quick release operable by pin man, attached to glider through release, operable by pilot, on the end of a 3-point bridle fixed to standard A-Frame.

Glider: Chargus, Midas E.

Pilot: Terry Dwight.

Conditions: Wind approximately 18mph., somewhat gusty. Severe wind gradient.

DESCRIPTION OF ACCIDENT (based on film)

Vehicle moving at 3mph. Glider at high angle of attack (stalled), sometimes supporting weight of pilot, sometimes not (i.e. small hops). Wing man (with radio). John Wescott, apparently ordered vehicle to increase speed to 5mph. The glider took off and started to climb. The climb rate accelerated all the way and at about 50ft. with the glider turning slightly to the right, the top leg of the bridle broke. This, due to high speed of glider, immediately pitched the glider into a 90ft. bank locked out situation. At this stage, the release mechanism on the glider failed and the glider was left turning downwind to inevitable impact with ground.

COMMENT/OBSERVATIONS

Equipment: Releases both ends of Tow line — good, but glider release failed under load — bad 3 point bridle attached to standard A-frame. 2 bottom attachment points, crude but did not fail or contribute to accident.

Top point

- (i) Mounted too far down A-frame — less effect in keeping nose down.
 - (ii) Rope threaded through hole with sharp edges very dangerous. This cut through under load, and started the chain of events that led to the accident.
 - (iii) Combination of bridle lengths and top attachment point set the angle of attack too high.
- Long keeled gliders are considered better tow gliders, certainly for beginners in towing.

Conditions

Strong winds on a flat site mean severe wind gradient. This has considerable implications when towing on a fixed length line. i.e. the airspeed of the glider will increase dramatically as it climbs.

Event/Accident

High angle of attack means that the glider will climb fast with high loads on glider, tow line etc., the greater the tension in the line, the greater this effect.

Due to the effect of the wind gradient (mentioned above) and the high angle of attack the glider was bound to

accelerate its climb rate and increase the line tension all the time as it climbed.

The top leg of the bridle breaking, with very considerable tension on the line led to the short keeled glider pitching up considerably.

As the glider was turning slightly, this pitch up was converted into a 90ft. wing over. The increased load induced by this pitch up led to the release mechanism failing. So, the glider was left at 90ft. bank at approximately 50ft. with little airspeed (had been used up converting glider to 90ft. wing over) in severe wind gradient. Impact with ground was inevitable.

If the release had not failed the glider (being "locked out") would have gone into an accelerating side slip towards the ground. Skilful timing of release by either pilot or pin man might have allowed sufficient speed to be built up to use this to "convert" the glider round more of the turn before impact.

If the top leg of the bridle had not broken the accelerating climb would have continued further, but the "lock out" would almost certainly still have occurred, though possibly at a height where once the line was released there would still have been room to complete the 360 and recover. *Once the glider took off, the pilot and pin man were powerless to do anything.* The forces on the glider were so great that the pilot's weight/strength became insignificant as a means of control of the glider. If the glider had been released it would have either looped or stalled very radically with almost no possibility of recovery. The moment the release broke was the first time in the flight that it would have been plausible to release the glider. The only thing that could have been done was for the flight controller to use his radio to tell the driver to stop and then reverse as fast as possible. But this would have required fast thinking and an awareness of what was happening and what could happen.

If the glider had been connected to a line tension control device rather than a fixed line, the radical climb would not have happened.

RECOMMENDATIONS

Equipment

- (i) Fixed line, must be releasable from both ends, and only used in very limited range of conditions.
- (ii) Releases must neither fail (nor seize) under any circumstances, home designed and built not satisfactory, must back release if over-flown.
- (iii) Weak link in line. 2 functions
 - (a) to prevent structural failure of glider etc.
 - (b) to prevent excessive loads/climb rates (more investigation needs to be done on this one).

(iv) Bridle system (a) 3 point bridle system is a compromise that is only satisfactory in conjunction with low tension tow. It can also induce pitch oscillations once the glider gets to a steep angle relative to the tow point on the ground. It can also create certain yaw problems. Both these occur when the glider is being towed off the top line and the bottom lines are slack. (b) V bridle with the top leg releasable (in preferably 2 stages) is important. This allows the angle of attack and therefore the climb rate to be controlled near the ground, and throughout the flight.

(v) Certain gliders appear to be more suitable than others. Longer keels for stability and pitch damping are more favoured by the Americans and Australians, but more experimentation needs to be done before this can be stated specifically.

(vi) *The most important thing* is that in all but the most stable conditions the glider is towed through a system that controls the line tension. This will compensate for gusts, thermals, coarse driving, wind gradient, rough ground (in the case of a vehicle mounted system), etc.

Conditions

- (i) If towing is done on a fixed line. The wind must be light, steady, and very little wind gradient. i.e. a very limited range of conditions. Any others are *potentially very dangerous!*
- (ii) If a line tension control system (L.T.C.S.) is used it is possible to tow in any conditions that one can free fly in. The limiting factor becomes the knowledge and experience of the L.T.C.S. operator and the pilot's skill, knowledge and experience. (e.g. after the accident, the High School of Hang Gliding tow team went to Little Rissington on a day when the wind was 20mph at ground level and fairly gusty to experiment with the wind gradient. For safety we attached 100ft. ropes to the ends of the cross spar as tether lines (these in fact proved to be unnecessary) with our L.T.C.S. set at 50-75lbs we made several ascents to 100ft. and one to 250ft. in every case the climb was very steady and smooth, while the descents, released from the line were extremely difficult due to the wind gradient — often landing almost stalled in spite of pulling full speed. On the climbs we found ourselves going backwards, faster and faster as we climbed through the wind gradient. Our height was limited by the fact that we were going backwards fast, in spite of pulling full speed.

Personnel

- (i) L.T.C.S. Operator or pin man is the most important person in a towed launch. He can kill or save a pilot in difficult situations. He must know

what he is doing and be aware of all the things that can go wrong and how he can cope with them. He must recognise and act on these things immediately to solve them.

(ii) The pilot must be able to keep the glider straight, making, as necessary, quick accurate corrections. He must be aware of what can go wrong and how to cope with these situations.

(iii) Driver just steers vehicle, controls speed as specified by pin man (it is better if pin man operates throttle).

(iv) Launch assistants/wireman as necessary for pilot, glider, conditions etc.

CONCLUSION

This accident was a classic example of the fact that towing is dangerous unless you have the knowledge and the equipment. In this case the team had neither. They were not aware of what is involved when you attach a hang glider to a tow line, how this affects its control and performance, how conditions affect its control and performance. They appear to have done effectively no research into towing at all, and that they allowed an almost complete beginner (regardless of how talented his flying appeared) to be the test pilot shows very little sense of responsibility or imagination as to the consequences.

PAUL BAKER

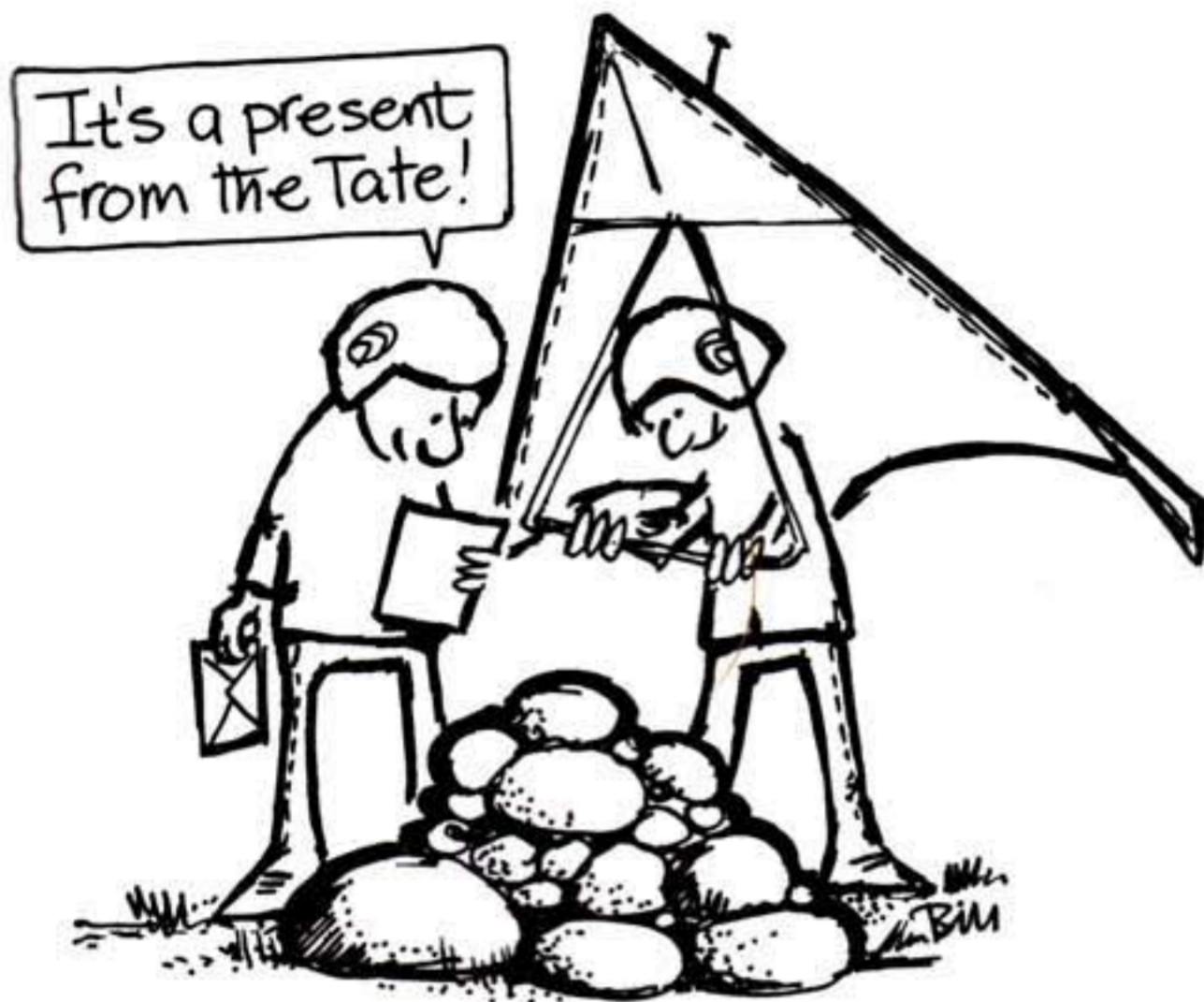
A TOWING FIRST

There was great excitement recently on a disused RAF station in Gloucestershire as Paul Baker, after a poor launch to 750ft. (the norm is now 1800ft.) connected with a thermal and started to wind his Maxi up to 2600ft. Ann Welch and I, mere spectators on the ground, worked out the best cloud line for a cross country flight, carefully avoiding the local MATZ and radioed up "Go for it".

But a lazy Etonian voice returned: "Well, I'm feeling a bit tired", and after 32 minutes of hopping from one thermal to another, did his usual low downwind leg and dropped in next to the towing vehicle. This has got to be the first half hour thermal flight from a tow launch — unless you know different?

KEITH COCKROFT

AIRMAIL



DANGER OF NEW INSURANCE RATES

Dear Editor,
I read Reggie Spooner's article on the new insurance rates very carefully three times, because this could put a stop to hang gliding faster than any council or even the CAA. I cannot disagree with any of it, and I know very well that Reggie has got us better terms than anyone else could have done.

I believe that the bulk of our members are probably young married people, between the ages of twenty and forty, with financial responsibilities. I think that the consequences of the increase will be either that they simply cannot afford to go on flying or they will be flying uninsured or with inadequate cover. My guess is that some will turn to other sports or other types of flying and some will take the considerable risk of flying uninsured.

I admit I cannot supply the answer to this problem, but I believe that we should all think about it hard. I think that if any money comes to us from the sports council some of it ought to help pay the insurance, but I doubt they would agree.

When you think of the huge sums of money lost by the government each year on such things as grand opera, which 99.9 per cent of the population would prefer to do without, or the money squandered by the Tate gallery on heaps of stones, which are supposed to be art, then I think it is a great pity that a true art such as flying has to suffer.

The BHGA should concentrate mainly on safe enjoyable flying for the bulk of its not very rich, nor very skilful members, and I believe that this is what it tries to do, despite the appar-

ent emphasis on excellence in all directions. Benefits filter down to the masses from the expertise of the few.

However, the insurance problems could leave the BHGA, with nothing but 200 experts and no money, and for most of us, that would be that.

Dunstan Hadley
Itchenor Green

HELMETS OR NOT?

Dear Editor,
With regard to the recent controversy regarding the wearing of crash helmets, surely it should be up to the individual whether or not he wears a helmet, in the same way that he takes off in dodgy conditions, or an experimental glider or whatever.

Obviously a helmet is first and foremost in protective gear but if one is to apply rules to enforce the wearing of protective gear, why stop at helmets? "All supine/seated flyers are to wear back protectors, knee pads and jackboots", is just as sensible (and just as enforceable) as a helmet rule.

We choose to take some risks inherent to hang gliding to enjoy the freedom of true flight. Some of us choose to take an additional risk to enjoy the freedom of true flight without the encumbrance of a helmet, cutting down on sound and vision inputs, and preventing the wind from blowing through one's hair while soaring a gentle breeze on a hot summer day.

A lot of this helmet 'rule' stuff is just a manifestation of peoples' instinctive desire to impose their will on others, and using safety as an excuse, they feel entitled to do so. As hang glider pilots tend to be 'thinking people' I would have thought we could recognise these things for what they are and realise

that choosing to fly without a helmet is precisely the same kind of choice as choosing to fly at all.

Everard Cunion
Pontypridd
Mid Glamorgan

PERSONAL LIBERTY

Dear Jeannie,
I am not acquainted with the full facts concerning the Lester Cruse incident at Devils Dyke, nor do I have any sympathy with anyone who behaves in an arrogant manner, but I must give him full marks for standing up against the "Little Hitlers" who seek to dictate what we must wear etc. etc., even although the Official BHGA Medical Adviser has stated that the wearing of helmets should be voluntary, albeit recommended.

And what a slip of the Editorial tongue (as per the comment at the end of Harold Rice's letter) to talk about it as "flouting the rules"; I have looked through all the BHGA literature on the subject, and can find no "rule" about it, except for certain competitions. Perhaps it was a subconscious prognostication by the Editor (and other Councillors) in anticipation of the day when they gradually but insidiously transmute all the present "guidelines" into "regulations", in the same manner that personal liberty has been gradually eroded over the past 40 or 50 years, without the public knowing very much about it (or indeed apparently caring). I define personal liberty as the right to do anything which does not harm anyone else.

Perhaps the "holier-than-thou" enthusiasts might do better to ensure that every hang-flier is complying with all the provisions of the Air Navigation Order (non-compliance of which is certainly likely to harm someone else). If there be any irresponsible behaviour, the matter can be dealt with through the medium of charges relating to some specific clause of the Air Navigation Order, or the all-enveloping one of "Dangerous-Flying", rather than the setting up of Kangaroo Courts to ban anyone from the League or deprive them of status (which incidentally, if it affects their livelihood, is contrary to E.E.C. Regulations). If anyone is dealt with in this way, for refusing to wear a helmet, be sure that my resignation will be on the Secretary's desk the next morning, followed I am sure, by an unspecified number of other members. This sort of talk is madness at a time when the Treasurer is appealing for an increase in the membership.

Tommy Thomson
West Drayton
Middx.

Editor's comment. The rules referred to were Southern Hang Gliding Club rules which anyone using their sites is expected to conform to. Tommy Thomson obviously didn't read my editorial in issue No.3. Failure to observe club rules can harm others — ultimately by causing loss of sites and removal of personal freedom for everyone.

ONE VIEW OF LESTER

Dear Madam,
An inch or two, if you can spare it, to give a different picture of that infamous loonie and nice guy, Lester Cruse.

In a roll-rate task at Merthyr Common at the first League this year, Lester got a bump of lift during a steep 180. The roll input came off to use the lift and it was the smoothest, most elegant piece of hang glider flying I've ever seen.

A couple of months before that he was up here delivering a Fledge, and I took the opportunity to quiz him on wingover technique. He refused to tell me and advised me to confine myself to steep 360s, offering effective advice on improving them. Other expert pilots have since described wingovers, but Lester refused to do so, because they are potentially very dangerous and he didn't want to encourage me towards the sort of situation he was so lucky to survive.

Casual about safety and somewhat rude on the Dyke it seems but, in my experience, helpful, friendly and concerned about my safety, and a delight to watch in the air. The human mixture I suppose.

I wonder whether a little more tact, all round, and an effort at least to understand the other person's point of view might not help everyone?

Ian Trotter
Edinburgh

... AND ANOTHER

Dear Jeannie,
So Lester was embarrassed. Before he is condemned any further, let us consider what this proves:- it is possible to get through to him. Harold Rice should take note how this was done. Where's your helmet, Lester? That was not an order. It was not aggressive.

Harold does not describe his own approach; but if he had taken the trouble to be polite it is virtually certain that he would have mentioned this to score an extra point. But he says he CALLED across; and it is dangerous to call in certain ways to a person just about to take off. Lester, I imagine, understands this better than anybody; and this is why he would be reactive, more than others would see reason for.

Also it seems evident that the Austrian was not going to put a helmet on anyway, because he must have heard the conversation. Given this situation, Lester would have put himself in the way of the emotional effect, to make the best of a bad job. The complication of a new machine was enough for the Austrian to deal with. It was especially important that he should not be distracted, in view of the extra risk he was taking.

I think most people would take the conversation which followed simply on its face value: Lester felt like putting Harold down. It would not be reasonable to deduce his actual feelings about helmets from this exchange.

Barrie Annette
Twickenham

MISLEADING ACCIDENT STATISTICS

Dear Jeannie,
Reference the report on Fatal Accidents '78 in *Wings!* No. 4. I was very interested in the individual reports and the investigator's comments, but I was very disappointed by the shortsighted way in which the graphical presentations were limited to '78 statistics.

What's going to happen next year when hopefully there will be less fatalities? Will the figures mean even less?

Surely we should try to build up the most complete picture we can from all the available information. Figures from all previous years should have been included to increase the population and thereby increase the validity of any possible conclusions.

Having got that off my chest I can only recommend all you people at risk to improve your chances by flying only in July and August, in the mornings on the Mondays and Fridays.

As for my generation, surprise, surprise! The risks are negligible! Perhaps my daughter should take it up. Her risk is negligible too! But who is kidding who?

The one true lesson is that we must all individually discipline ourselves to learn from the ten experiences quoted.

Terry Prendergast
Weybridge, Surrey



PARACHUTE LETTER WAS NEGATIVE

Dear Madam,
The letter in *WINGS!* No.4 entitled "Fatal accidents and parachutes" was totally negative. Perhaps it was written out of a sense of frustration over the deaths of 29 "poor sods clawing", but that does not explain or excuse the one-sided way in which the facts were presented. Bill Cowell completely ignores the many "saves" achieved by commercially-available chutes.

My system was recently inspected by a licensed rigger who felt it represented good value for money, and good design in view of the limitations imposed by the glider itself. He said there was no way he could produce a similar system at a cheaper retail price. All my parachute has done is to slightly improve my confidence, but a fellow club member had an A-frame collapse at 200 feet ATO, and was able to deploy his system, thus averting serious injury.

We tax payers are naturally relieved that the Army found Bill's chute a profitable exercise, considering how much their test programme has cost us. Can we look forward to their system being marketed at £95 in the near future? Can we hell!

What matters if that Bill and I have both got parachutes which may one day save our lives, regardless of cost. I pray that neither of us will ever have to use his 'chute. I pray that Bill's letter has not deterred somebody from buying a system who is going to need one in the next few weeks.

Simon Murphy
Honiton, Devon

PARACHUTE CONTROVERSY

I should like to answer the article in *Wings!* No. 4 headed Fatal Accidents and Parachutes as follows:

There seems to be quite a lot of controversy in the design and function of hang gliding escape systems and with this in mind the answer to the safety-minded hand glider pilot is to wear a parachute.

Although this in itself is a feeling of security whilst flying, the whole aspect of a safe descent in the event of a mid-air structural failure of a hang glider air frame or whatever, depends solely on deployment, I read with immense interest the article from Bill Cowell and must agree on one thing: that some deployment systems which I have seen make one shudder to say the least.

Bill makes a point with reference to the number of accidents, which I would take to be a world-wide figure. Although there seems to be a serious malfunction rate, unless the facts given are circumstances, one cannot put a true picture on the reasons of malfunction occurrence: in other words, what percentage of this figure was truly human failure and what percentage was actual rig design failure?

My own view on hang gliding systems are 100 per cent for deployment bag design, with properly stowed lines and girdle.

I do not agree however, with the coiled spring drogue deployment against the kicker plate. This is a first class system of deploying a reserve after malfunction and cut away from a main canopy, but we are not parachutists and our situation would be quite complicated with the possibility of bits and pieces of hang glider draped around us.

If I read the article correctly 'Bill Cowell' would have no control on the direction of deployment from his army manufactured rig. The canopy used in this rig would be the old faithful I 24, or a T 10A with Lackengirths. Both these canopies I would agree are excellent. I have seen many lives saved by the deployment of these after main canopy malfunction, but for hang gliding one must have control on the development direction. Remember it would still be possible to have debris hanging below, even though a pilot is flying in a prone position. Then it would be a mistake to pull the plug and 'have the deployment blast out wherever the drogue decided to take it.

With regard to the statement made and I quote 'the eddy of wind', this would not occur with a deployment bag system. This problem is sometimes

encountered when a parachute is deployed from the back of a parachutist, whilst he is in the green side down (face to earth) position and called a 'hesitation'. I intend to manufacture my own rig using the old faithful I 24 but certainly with a deployment bag and properly stowed lines etc. I would want to be in total control of any emergency situation and not reliant on a coiled spring to blast off in any direction dragging the canopy after it. I am convinced that the correct opening is the same for sport parachute deployment, i.e. lines first, canopy second. In hang gliding you would throw the canopy first to clear any debris, thus deploying the bridle. This in turn would pull out the lines, then the airstream would inflate the canopy and open same.

Most parachuting malfunctions are caused by either a bad body position, or incorrect packing. I have witnessed both these occurrences, and would conclude this by saying that provided your parachute is a well-designed system, neatly packed and deployed into space, then and only then can you depend on a relatively safe descent to earth. You must also remember that your worries are not altogether over because you could be flying in a 30mph wind, and believe me, it is no joke being blown horizontally as well as dropping through the sky at a vertical speed of approximately 19ft. per second.

Happy landings!

Bert Tyrell
Wootton Bassett
Wilts

BAD ADVICE ON PARACHUTES

Dear Madam, I was most disturbed to read Bill Cowell's letter regarding parachutes in *WINGS!* No.4. I think that this was full of bad and dangerous advice.

I saw one of these Army packs from a member of the German Briforge Club at the A.G.M. and, frankly, I considered it to be a positively dangerous system. The workmanship was superb. The pack was for a seated harness and was worn like a rucksack. An 'over-the-shoulder' ripcord tube and standard parachuting ripcord deployed the pack which was 'blasted' away by the 36" spring extractor Bill Cowell is so proud of. Beautiful for a free falling pilot who does not have to contend with 95 feet of aluminium tube, 200 square feet of sail and, perhaps, 126 feet of rigging wire.

Having no control over the direction to which you can throw your pack could be disastrous; gliders tumble, twist and spin in many cases. A case in the Pennines of an inverted glider had the parachuteless pilot lying upside down on the rear of the sail. 'Blasting' his pack off would have resulted in a mess, whereby, throwing it in a particular direction could have resulted in a clean deployment.

There is nothing wrong with an Army reserve parachute. They are heavy, bulky, but cheap. If you insist on one and are prepared to put up with the

weight and inconvenience then take it to a professional rigger and have it repacked — not as a sky diver would use it, but related to our particular circumstances: i.e. possible slow speed deployments from out of a mass of broken glider which may be wrapped around the pilot.

I would also like to ask Bill Cowell to send us details of the 29 malfunctions he talked about. According to January's Hang Gliding Magazine:

'Conservative deployment statistics were reported as follows: 40 total saves, 28 documented and 12 undocumented. They are: Windhaven EPS:4 U.S. documented, 6 European documented. Advanced Air Sports Products, Inc. 1 U.S. documented, 5 European documented. Bennett BUS: 8 U.S. documented, 10 European undocumented. Guardian-FXC Corp. 2 U.S. documented. Odyssey Sky Industries: 2 U.S. documented, 2 European undocumented. Reported deployments outside the U.S. are slower in reaching the manufacturers and distributors, so those counts may be low for the actual saves.'

Later on in the article regarding malfunctions.....

'There have been a few times when chutes did not work.

A description of these problems might help a pilot in an emergency.

A pilot was on a 70 foot hill. Just as he went to take off a strong gust hit him and blew him nose high as he rose above take-off. He knew he was going to hit hard so he threw his chute out. It never even reached bridle stretch.

A pilot's glider tucked 400 feet above the ground. His chute ended up in the rear flying wires. The bridle and lines played out. He never tried to redeploy the chute.

At 70 feet a pilot's glider that had been assembled incorrectly fell apart in a wingover. The chute was thrown, but never got out of the bag.

A chute accidentally deployed on a 400 foot cliff launch.

A pilot crashed on take-off and the glider took off anyway, accidentally deploying the chute after the container opened on contact with the ground.

A glider tucked right after take-off and tumbled three times before hitting the ground 300 feet below take-off. The pilot was too busy trying to get the glider under control to go for the chute.

A pilot was 300 feet above an 11,000 foot peak when his glider tucked. Rather than deploy his chute and risk drifting away over a canyon, he decided to crash on top of the mountain.

A couple of pilots could not get the containers open in time.

Only two of the above pilots died. The other ones lucked out.'

It seems that some of these 'malfunction situations' were probably unrecoverable anyway, but 40 documented saves are enough to convince me of the desirability of a 'TESTED' reserve system. £95.00 may be "cheap", but is £200 too much to pay for a chance of saving your life?

John A. Hudson
Rochdale, Lancs.

INFORMATION

DARTMOOR COMMONS BILL

By the end of July all Club Secretaries will have received a circular from the BHGA Secretary asking for help in lobbying MPs to have references to hang gliding removed from the Bill.

Will any member who feels particularly able to represent our case to MPs or who knows MPs or Members of the House of Lords please contact his/her Club Secretary for details. If you don't belong to a club contact Taunton Office.

SITES

A circular was sent out by the BHGA Secretary to all Clubs controlling sites in late June. If you are a Club Secretary and did not get one please contact the Taunton Office at once. Mike Caston urgently needs the information requested to help in negotiations with the C.A.A. It is possible that the most heavily used sites can be allocated ATZs. If you have not yet sent a reply please do so by the end of July.

AIRSPACE NEWS

AIRMISS

We have been reminded by the CAA of the necessity to report an Airmiss immediately. However an Airmiss should only be reported when a definite risk of collision occurred. The initial report should be made to any ATC Unit by telephone followed by a report on the appropriate form sent to the Joint Airmiss Section in Uxbridge. An Airmiss report should only be filed by the pilot/pilots concerned.

NOTAMS

Please notify the CAA of any competitions to be held, by originating a NOTAM.

LOW FLYING

If you fly a site near a Military Low Level area, please contact the local Military ATC Unit and inform them of your intentions. Military Low Flying Maps are available from Taunton.

GEORGE CAYLEY SAILWING CLUB

The new chairman is Richard Ware of Pickering Cottage, Staxton, North Yorkshire. Tel: Sherburn 333 and the new secretary is Simon Hetherton, Garden House, The Ryde, Skelton, York. Tel: Beningbrough 241. All visiting flyers should contact either of the above for full details of sites.

RECEIPT OF WINGS!

If you change your address or copies of *Wings!* do not arrive please contact the Membership Secretary at the Taunton Office as soon as possible.

VISITORS TO DOVER & FOLKESTONE SITES

Visitors are extremely welcome but because of an ever-increasing influx the club there has decided that some form of control is necessary. In order to prevent any disappointment, both visitors and club members, and any pilots wishing to use the sites should contact the club flying and safety officer, Phil Hart, telephone Hawkinge 2066. He will make appropriate arrangements.

Because of a lack of sufficient parking and rigging space at the sites, the club is going to apply a limit of five visits per year for each visitor and can only accept a maximum of five visitors on any one day.

The regulations have been imposed with regret, but the club feels that to continue with the present free-for-all would jeopardise the present tentative arrangements.

The new club secretary is Bob Kelly, 68 Bekesbourne Lane, Littlebourne, Canterbury, Kent.

KNOWING ABOUT WEATHER

A course entitled "Understanding Weather" will be run at Malham Tarn Field Centre in Yorkshire from 15-22nd August 1979. Course tutors are Keith Weston and David Warren of the department of meteorology, University of Edinburgh, Mayfield Road, Edinburgh.

It is particularly suited to people who are involved in weather-sensitive sports like ours and involves some interesting practical work. It should be well worthwhile for anyone who has the time available.

SOUTH DOWNS CHAMPIONSHIP

A reminder that entries for the South Downs Championship to be held August 25th, 26th, 27th should be sent to Jeannie Knight, 10 Spring Gardens, Washington, Sussex as soon as possible.

SOUTH WEST WALES HANG GLIDING CLUB

As from August 4th the secretary, Tony Fletcher, will have the following address and telephone number: 27 Portia Terrace, Mount Pleasant, Swansea. Tel: Swansea 49825.

SOUTH EAST WALES HANG GLIDING CLUB

Because of some appalling examples of flying on one of the club's sites recently, visitors are requested to give the club the courtesy of a telephone call before flying any of the sites. Secretary is Martin Hann, telephone Cowbridge 2953.

DUNSTABLE HANG GLIDING CLUB

The club is now flying under a Bedfordshire County Council bye-law authorisation which in fact allows hang gliding to take place, but under severe restrictions. Basically these are: only two gliders soaring in the air at any one time, a height limit of 100ft. above the ridge, and not beyond 50yds. out from the ridge and specified take-off and landing areas.

These restrictions are written into the bye-law by the council with the co-operation of the London Gliding Club in whose A.T.Z. we fly. It is renewable on a yearly basis.

The frustration of members and visitors to Dunstable is very understandable. It's even worse for our club officials who are doing their utmost to keep the situation under control. Most flyers are remarkably tolerant in the circumstances and most pilots now abide by the two in the air only, and the 50yds. from the ridge rules. The height limit is so restrictive that we are finding this very difficult to control with the latest high performance gliders.

We would ask any flyers who do inadvertently go way above the height limit not to admit to any irate London Gliding Club official who appears on the hill that we cannot keep below a certain height in certain conditions. This plays right into their hands when we ask for a relaxation of the rules. They love quoting these remarks as examples of us not being in full control of our gliders and until we have proved ourselves, they use this sort of comment as an excuse not to allow us to widen our flying limits.

We as a club do not accept these limitations as permanent of course and are seeking as many ways as possible to get them changed, we hope initially that a meeting between BHGA, the B.G.A., ourselves and the London Gliding Club maybe able to work out a fairer and realistic set of flying rules for flying Dunstable.

Until we have achieved this we hope all flyers will appreciate the frustrating and difficult situation we have at Dunstable. We operate a temporary membership scheme which is £1 for seven days, this helps towards a very heavy farmers' fee and insurance. We have site marshalls on duty at weekends who will give visiting flyers the do's and don'ts.

The club meet on the second Tuesday of the month at the Chequers public house, Whipnade which is two miles from Dunstable Downs.

For further information, please ring Dennis Munn on Uxbridge 39896.

EMU

Due to a communication problem the Emu was prematurely advertised as being approved by BHGA. The fact is that Vulturelite have not yet received a certificate of airworthiness and their application is still being processed.

RHOSSILI

Problems have started relating to visiting flyers. Pilots must still contact officials of the South West Wales Hang Gliding club (the secretary is Tony Fletcher, telephone Swansea 49825) and observe site rules.

An unknown flyer on a Cyclone recently landed in the camp site, which is strictly forbidden. The club holds the site in trust for all BHGA flyers and there is a limit to official tolerance of misdemeanors. Don't lose this site.

RHOSSILI: SITE RULES

1. All flyers must be Full Members of the BHGA.

2. All flyers must liaise with HM Coastguard before flying commences in order to verify the situation regarding low-flying aircraft from Brawdy or Swansea Airport, weather and tides. Ensure that HM Coastguard are notified when flying has finished for the day.

3. The minimum number for flying is one pilot airborne and another pilot at the take off area observing the flying.

4. TAKE-OFF AREA: The crest of the Ridge and Pimple, down to 30m below the top. Note: Leave airspace in from the take-off area clear when others are waiting to take-off.

5. RIGGING AND PARKING: If you are not about to take-off rig and park at least 10m behind the take-off area. Keep all gliders parked flat.

6. FLYING LIMITS: North: a line east-west from the southern end of Hill End Caravan Site. South: a line along the foot of the cliffs continued east along property boundaries. East: a line parallel to the Ridge crest and 200m behind it. West: the sea. NEVER FLY OVER THE SEA. SEA.

7. LANDING AREAS: You may land back at the TOP or on the BEACH only. NOWHERE ELSE.

8. The maximum number of gliders flying the Ridge at anytime is 20, and flying the Cliffs is 4. These numbers may be reduced at any time, at the discretion of officers of the South West Wales Hang Gliding Club, according to conditions. When the maximum number of gliders in the air is reached, and other pilots are waiting to take off, flyers must restrict the duration of their flight to 30 minutes on the Ridge, or 15 minutes on the cliffs.

9. Only recognised gates, stiles and paths are to be used. DO NOT climb over walls or fences.

10. Only the Official Car Park is to be used.

11. Any breach of Site Rules, or Accident must be reported to the secretary of the South West Wales Hang Gliding Club.

12. Take off in the correct areas. Land back at the TOP or on the BEACH only.

13. The wind at Rhossili is usually very smooth coming off the sea, but this is not so when the wind is at an angle to the ridge. Flying is NOT ADVISABLE IN S.W. WINDS.

MORE NEWS FROM THE MANUFACTURERS' SIDE!

DEFLEXOR SYSTEMS v DRAG

Ken Messenger poses a question for everyone . . .

A year ago it was almost standard practice for gliders to have triple deflexor systems. This is an awful lot of wire and metal festooning the glider. Now suddenly it is fashionable to have none whatsoever and claim drag reductions because of this. It seems that we have gone from one extreme to the other.

The basic reason for triple systems was the tighter sails coming into use and 1½ in. diameter leading edge tubes which are not really strong enough for many modern configurations. Gliders which have no deflex wires at all appear fine, but have several inherent problems. Firstly washout depends on the wing loading as a heavier pilot is able to force the leading edge back allowing the sail more washout. It could be possible to have excessive washout which will detract from performance. On the other hand a light pilot could possibly fly with minimal washout because he has insufficient weight to curve the leading edge enough. One way around this problem is to fit a wire right across the trailing edge holding the leading edges back to set the minimum safe washout. The snag with this is of course you have virtually reintroduced as much drag as a single deflexor wire.

Another potential difficulty with a deflexorless glider is when a pilot has a heavy landing and puts a curve back into one wing tip. It is possible that this could not be observed whilst the glider is on the ground. Once airborne without the tension in the leading edges being equal a decidedly exciting flight could result.

It is always necessary to have a substantially longer cross spar with a deflexorless system. This is likely to mean in addition to the extra length of the tube, a larger diameter is needed to maintain sufficient column strength. Weigh the extra tube against the drag of a single deflex wire. A drag saving? I doubt it.

Having carefully considered all these alternatives, on the Cherokee we use a single deflex wire in conjunction with a very strong low drag tubular wing post, giving us the following advantages.

1. Positive, fine tuning, using the turnbuckles.
2. A system not unduly influenced by differing pilot weights.
3. A system where damage is readily visible.
4. Lowest drag consistent with strength and safety.

What do readers think?

NOTICE FROM WILLS WING, INC.

While doing HMGMA certification load tests on the OMEGA 260, we found that the crossbar was the first member of the airframe to yield, and that it yielded at a load which we felt was insufficiently high. We have redesigned the xbar, and are sending this modification kit with which you can alter your xbar to bring it up to current design standards. With the modified xbar, the 260 pulled 2000 pounds in the positive loads test, well in excess of the load required for certification.

The modification kit consists of two pieces of 1⅞" .058" tubing, 8'10" long. These are to be used as oversleeves, and the presently installed crossbar innersleeves should be eliminated.

First, drill out the rivet which secures the innersleeve in each crossbar half. Remove the innersleeve, and carefully sand the area around the rivet hole on each crossbar half with an ultra-fine grit emery paper. Carefully check your crossbar halves for straightness, if they are at all bent, the oversleeves will not slide on.

Second, liberally lubricate the inside of the oversleeve with WD-40, and carefully wipe the crossbar half with an oil dampened rag. Slide the oversleeve on to the inside end of the crossbar half, sliding the oversleeve about 7"

past the end of the crossbar half. **DO NOT POUND ON THE OVERSLEEVE OR XBAR HALF TO GET IT ON**, if it slides on with difficulty, use straight pressure to slide it on. If you have problems with this, give us a call.

Third, reassemble your crossbar on the glider, and slide the oversleeves inboard until they butt up against the crossbar centre section. Drill a ⅜" hole 6" outboard of this butt joint, and use a set screw or rivet to secure the oversleeve at this point.

While doing HMGMA certification load tests on the OMEGA we found that under a **negative** load, the kingpost was the first structural member to yield. We feel this is an undesirable design feature, and have redesigned the kingpost to strengthen it. We are providing modification kits to all OMEGA owners to bring your kingpost up to the current design standards. The kit consists of a 60" length of 1" .065", with which to innersleeve the kingpost. With the redesigned kingpost, the OMEGA passed all the HMGMA negative loads tests.

To modify your kingpost, remove the bolt that holds the kingpost to the kingpost bracket, and remove the kingpost from the bracket. Pull out the short 1" innersleeve from the bottom of the kingpost, and insert the 60" innersleeve from the bottom. The innersleeve will slide in easier if you first lubricate it and the inside of the kingpost with oil. Slide the innersleeve up flush with the bottom of the kingpost, and use the ¼" holes in the base of the kingpost as guides to drill a ¼" hole through the sleeve. Remount the kingpost to the bracket and reinstall the bolt.

AIRWORTHINESS SCHEME

In order to keep BHGA members informed as to the progress being made by one aspect of the airworthiness scheme, I have submitted a type of league table that is fairly self-explanatory and will be updated in the next issue of *Wings!*

The table denotes which manufacturers have applied for Certificates of Airworthiness and the progress each application is making. Failure by manufacturers to apply for, and eventually receive, a C of A for a hang glider will debar them from advertising that particular model in *Wings!* until they meet the requirements of the BHGA, as agreed between the BHGA and BHGMF.

Barry Blore
BHGA DEVELOPMENT OFFICER

Flexi-Form Skysails have not been included in the table since the Company is in the process of being taken over by Hue McGovern.

APPLICATIONS FOR CERTIFICATES OF AIRWORTHINESS AS AT 15/6/79

MANUFACTURER	MODEL	NOT YET SUBMITTED	PARTIALLY SUBMITTED	SUBMITTED	BEING PROCESSED	PROCESSED	C OF A
BERDMAN SPORTS LTD	CHEROKEE 5	✓	✓				
	CHEROKEE M	✓	✓				
	CHEROKEE L	✓	✓				
	MOONRAKER 78	✓					
CHARGUS GLIDING COMPANY	CYCLONE 180	✓					
	CYCLONE 165	✓					
	VORTEX 120	✓					
ECLIPSE	EAGLE II 5	✓					
	EAGLE II L	✓					
	SUPER EAGLE	✓					
HAWAY HANG GLIDERS LTD	SUPER SCORPION B C C+	✓	✓	✓			
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HANG GLIDING INSTRUCTORS ASSOCIATION

REPORT ON SEMINAR RUN IN MARLBOROUGH AREA 3rd AND 4th MAY 1979

The meeting took place over a Thursday and Friday; the first day covering practical training practice on the hill together with assessment of gliders — and the second day was spent indoors with the discussion centering largely on communication.

Tether Training

Those assembled were introduced to four students training with a school

and during the course of the day four gliders were used and one CFI was asked to head the training on each glider in an observing capacity. Different instructors took turns to teach and assist. A discussion took place on the pros and cons of different techniques of line use and also the best type of glider to use at this stage of training. Graham Slater and Tom Knight demonstrated beginning take-offs with both hands on the bottom bar using a Vortex. Ashley Doubtfire recorded some of the training on film to be shown at the next seminar. The group was generally impressed with the different training methods used and everybody was able to gain from this practical work. A view was expressed that gliders with keel pockets and plenty of roach were more suitable for beginner training than the second generation, faster flying gliders.

Glider Assessment

Report Sheets were filled in by most of those present and covered information gained from flights on the following gliders both at the assessment at Rivar and from previous experience:

Vortex 120
Hiway Harrier
Hiway Gemini
Hiway Super Scorpion
Hiway Spectrum
Detuned Vortex 120
Flexiform Spirit
Vortex 110

Summary of information on gliders reported on:

Vortex was thought to be generally difficult to handle in the air at high speeds and poor to handle on the ground. Not thought to be very suitable for a first solo flight except in cases where the previous (tether) work has all been done on the same type.

Harrier Excellent for first solo flying. 'The ideal trainer'. Not a bad word about the glider for initial training.

Super Scorpion No-one felt that it was suitable for first solo flying except perhaps at the end of a PI course. Too sensitive.

Spectrum, Gemini Tip stalling tendency rules it out for beginner training. Large glider designed mainly for dual flying. OK with the appropriate experience of instructor.

The following day the seminar covered communication in relation to syllabus, training aids and techniques. Take-off techniques and the instructor handbook were also discussed in detail.

**ASHLEY DOUBTFIRE,
CHAIRMAN**

Photo Mark Junak

THE LEAGUE

Four League competitions have been run this year, three of them successfully. The first, in South Wales, run by Roy Hill, had five tasks, and was a great success after early criticism of the first task, unduly affected by the weather. The second, on Southern Club sites, run by Tom Knight, only completed one task before running into terrible weather. That task, originally allocated on "topping up" to the third League, is now on standby again, following a committee meeting on June 10th. The third League, in North Wales, organised by Jan Ketelaar, was a milestone; only two tasks were run, but they were both cross-country, and the local hill record was beaten by a factor of three by top pilots like Graham Hobson and Bob Calvert. The third was a particularly "low-scoring" competition because of its emphasis on XC. Last weekend, the fourth of this year's competitions was completed, in Scotland, organised by David and Liz Squires, and in many ways, it was the best we have ever had. To begin with, five tasks were successfully completed, but there's a new sophistication about tasks now which enables us to divide them into three or more tests, virtually eliminating weather changes.

Winners so far have been Graham Slater, Graham Hobson and Bob Calvert, all previously League competition winners, which indicates that class flyers are winning. The TOP TEN, as of last weekend, is as follows: 1. B. Calvert (784.80) 2. G. Slater (727.70) 3. R. Bailey (695.98) 4. K. Reynolds (686.46) 5. B. England (665.40) 6. L. Cruse (654.81) 7. G. Hobson (648.90) 8. M. Maher (626.90) 9. M. Atkinson (601.16) 10. D. Garrison (596.83)

Dave Garrison is the first of this year's League entry pilots to make the top ten, and is highly thought of. Others of the new batch to watch are John Bridge, who jumped from 39th to 15th place in the last League; Richard Iddon (34th to 21st place); and Greg Burgess, who is at 18th place.

BRIAN MILTON



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with immediate response which is so necessary for all kinds of flying.

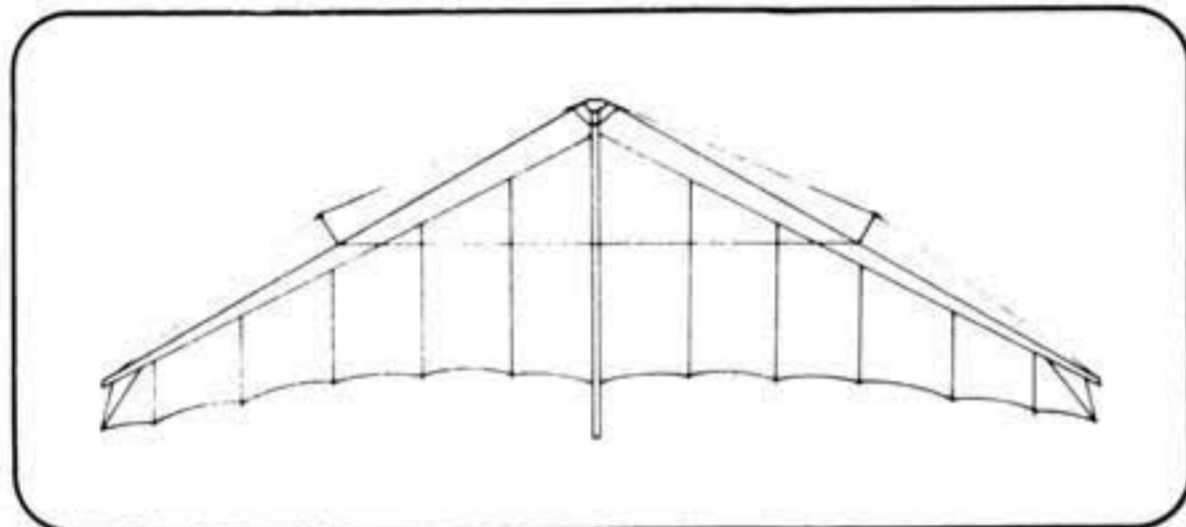
Glide angle at speed is good. The reflexed preformed battens in every seam make the whole wing pitch positive without the need for locked up tips etc. Vertical dive recovery is positive.

Safari is a real cross-country machine which easily makes use of thermals and handles the strong turbulence which often goes with them.

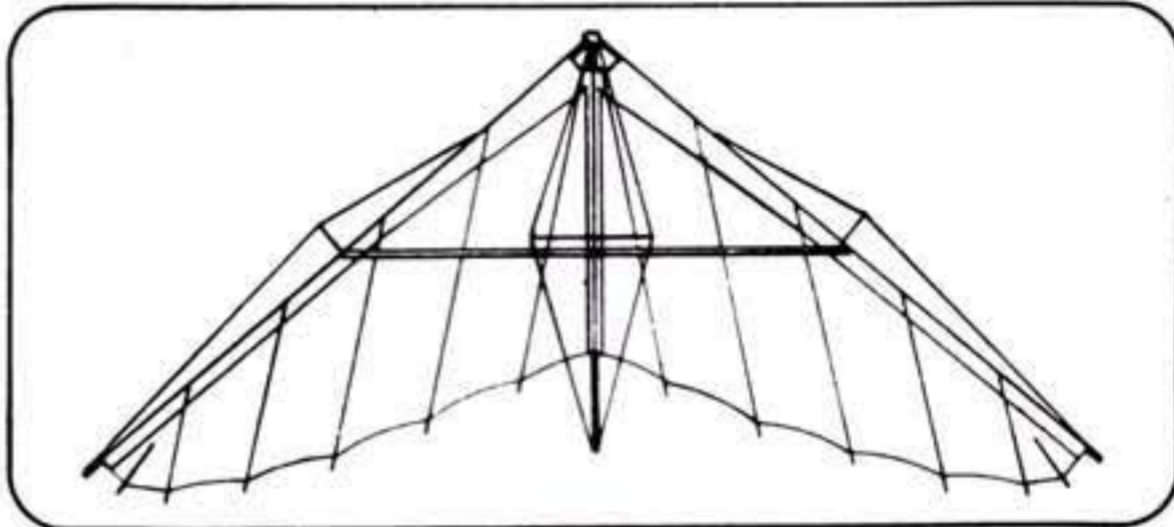
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For your own safety, if you are purchasing a second-hand glider, check that it is a registered BHGA model, see it test flown, test fly it, and inspect it thoroughly for damage or wear to critical parts. If in doubt seek advice from the Club Safety Officer.

All small ads should be sent to Lesley Bridges, Commercial Editor, *Wings!*, Yard House, Wentnor, Nr. Bishops Castle, Shropshire.

Ads sent to any other address will be redirected and therefore delayed.

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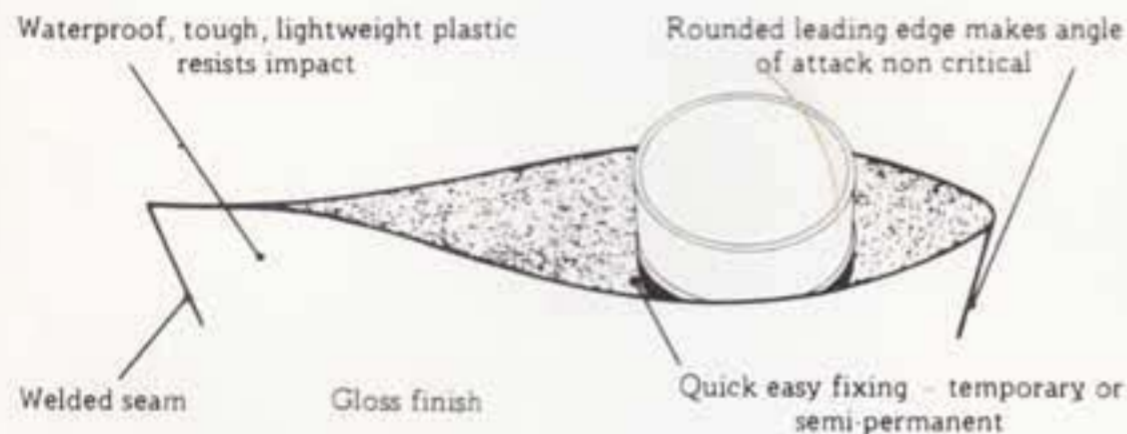
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Conceived as a glider offering a genuine performance increase, while remaining easy and forgiving to fly, the Emu is the first production glider to combine the advantages of a bowsprit type airframe with a flex-batten cambered sail.

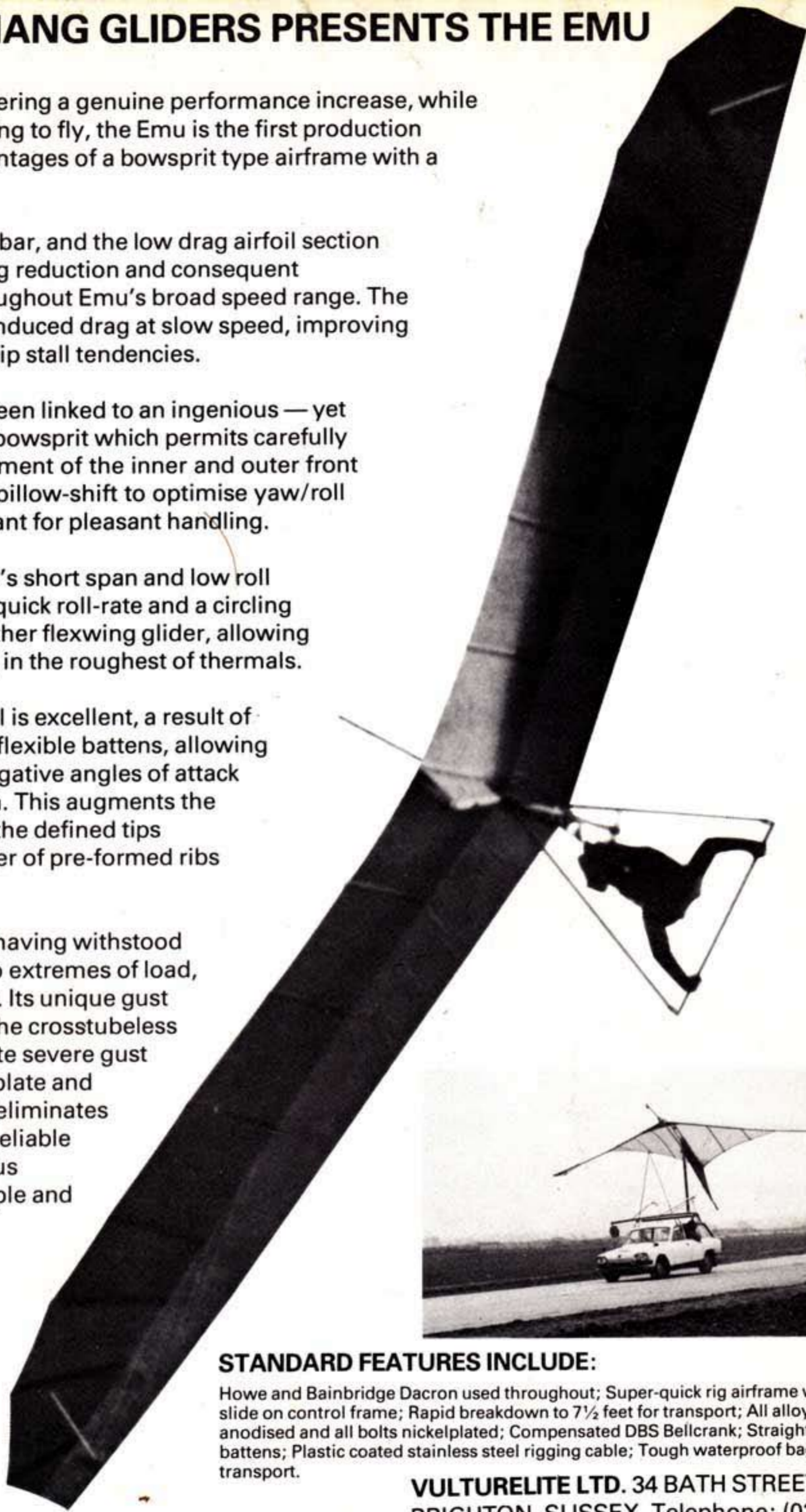
The absence of a crossbar, and the low drag airfoil section achieve a considerable drag reduction and consequent performance increase throughout Emu's broad speed range. The low sweep angle reduces induced drag at slow speed, improving the sink rate and reducing tip stall tendencies.

The front wires have been linked to an ingenious — yet simple — bellcrank on the bowsprit which permits carefully matched differential movement of the inner and outer front wires, thereby controlling billow-shift to optimise yaw/roll co-ordination — so important for pleasant handling.

This combined with Emu's short span and low roll inertia gives an extremely quick roll-rate and a circling ability unequalled in any other flexwing glider, allowing efficient, confident soaring in the roughest of thermals.

Pitch stability and control is excellent, a result of advanced sail camber and flexible battens, allowing the sail to blow down at negative angles of attack adopting a reflexed section. This augments the positive pitching action of the defined tips without the potential danger of pre-formed ribs near the leading edge.

The Emu is very strong, having withstood extensive vehicle testing to extremes of load, both positive and negative. Its unique gust alleviation system allows the crosstubeless airframe to flex and mitigate severe gust loads. Also, the use of flat plate and straight tube components eliminates weaknesses caused by unreliable pre-formed alloy parts. Thus replacement parts are simple and inexpensive to fit.



STANDARD FEATURES INCLUDE:

Howe and Bainbridge Dacron used throughout; Super-quick rig airframe with nylon slide on control frame; Rapid breakdown to 7½ feet for transport; All alloy parts anodised and all bolts nickelplated; Compensated DBS Bellcrank; Straight flexible battens; Plastic coated stainless steel rigging cable; Tough waterproof bag for transport.

**VULTURELITE LTD. 34 BATH STREET,
BRIGHTON, SUSSEX. Telephone: (0273) 27364**

SPECIFICATIONS: UK Price £533 plus VAT (Either Size)

	<i>Sail Area</i>	<i>Aspect Ratio</i>	<i>Nose Angle</i>	<i>L/E Length</i>	<i>Knockdown Length</i>	<i>Weight</i>	<i>Pilot Weight</i>
LARGE 35ft.	195sq.ft.	6.3	140°	17.5ft.	7.5ft.	52 lbs.	126 – 210 lbs
SMALL 33ft.	170sq.ft.	6.4	140°	18.5ft.	7.5ft.	49 lbs.	126 – 210 lbs