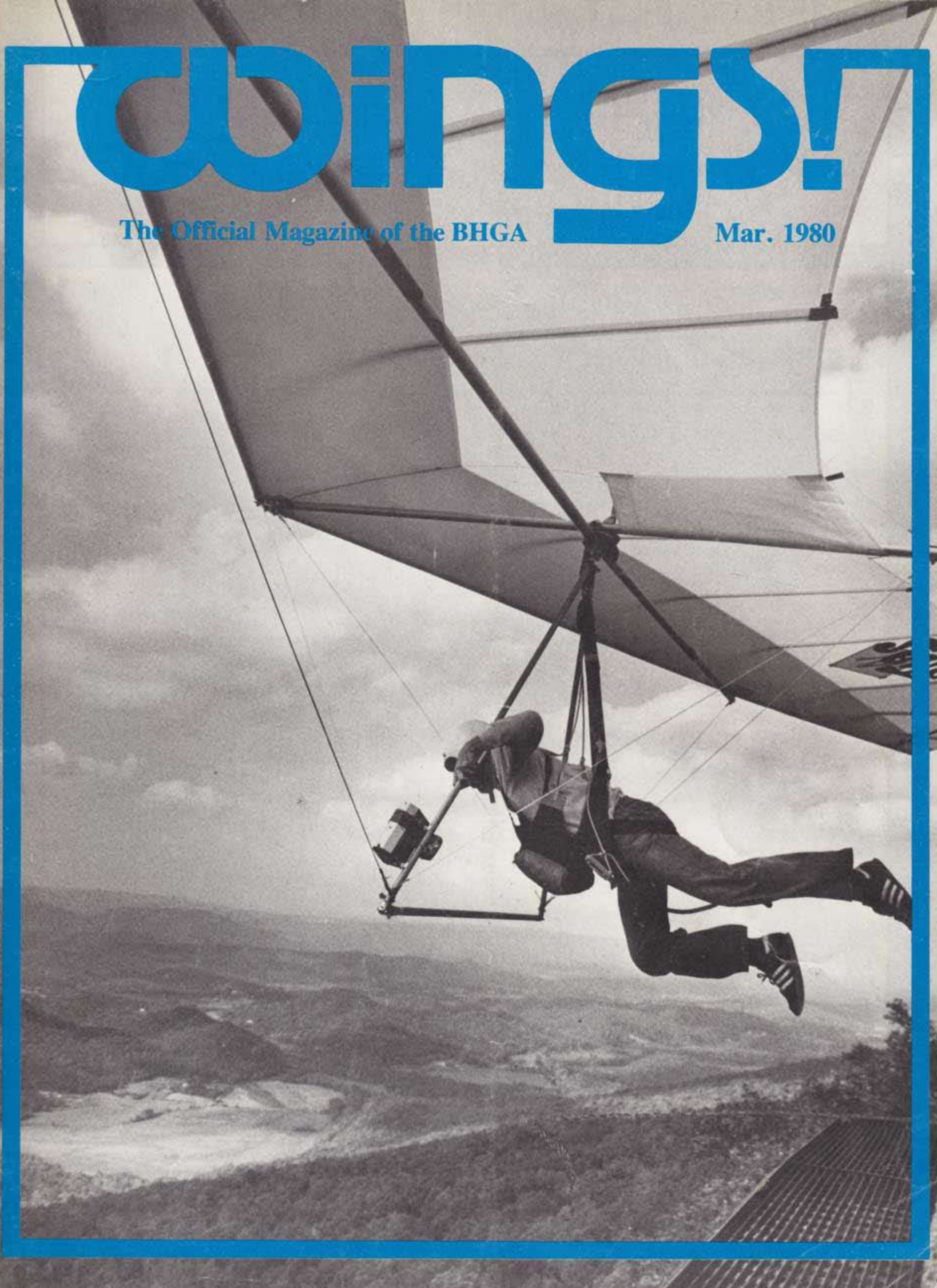
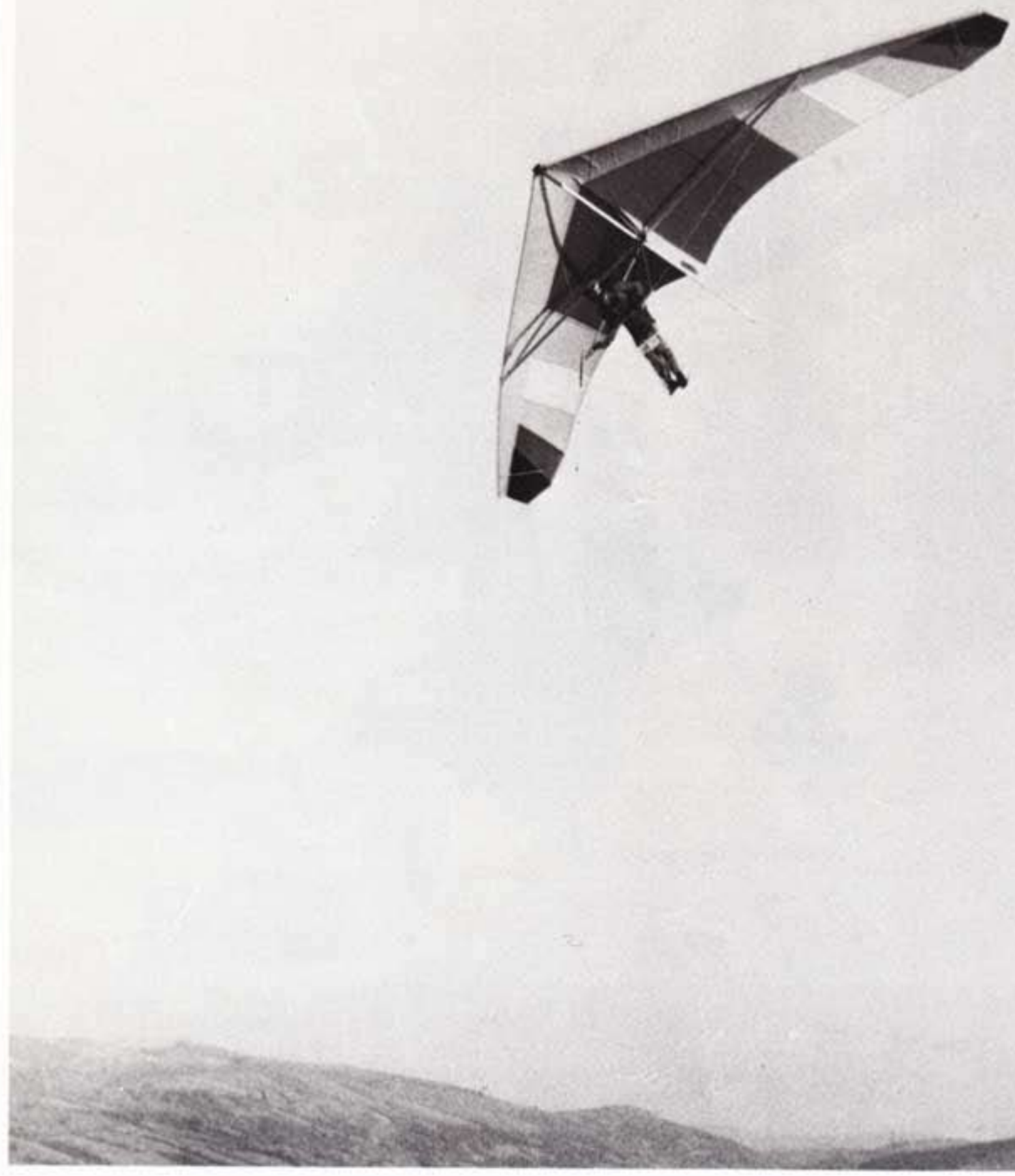
# wings!

The Official Magazine of the BHGA

Mar. 1980



# CANOLFAN BARCUTA CYMRU
# WELSH HANG-GLIDING CENTRE



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**COVER:** *Bob Calvert, British Champion, launching at '79 America's Cup. Photo: Steve Mayfield, News-Free Press*

# Wings!

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*WINGS!* may be obtained regularly by joining the BHGA or on a subscription. For full details and information about the sport send a s.a.e. to BHGA, 167A Cheddon Road, Taunton, Somerset. Membership of BHGA includes Public Liability Insurance cover.

If members or subscribers change address or copies of *Wings!* do not arrive please contact the Membership Secretary at the Taunton Office. In all correspondence give your full name, address and membership number (if applicable).

If you, your club or any local hang gliding activity gets written up in a local paper, national paper or magazine please send a copy to the Taunton Office for the BHGA press cuttings collection. This applies to the UK only.

# EDITORIAL EXTRA

## VALOUR AWARD

Like every other pilot, I was really turned on when a 29 year old Frenchman, Jean-Marc Boivin, was awarded the INTERNATIONAL AWARD FOR VALOUR IN SPORT, for a leap he made from the second highest mountain in the world — K2 — in a hang glider last year. Jean-Marc had apparently spent four months climbing up the mountain, and it was while on ASCENT (not DESCENT, as some newspapers had it) that he lost 50% of sight in one eye, and 70% sight in the other. Previous winners of the award — a £100,000 trophy which he held for ten minutes, plus a £5,000 gold pendant which he keeps — include the racing driver Nikki Lauder, and that marvellous Japanese who walked to the North Pole and back, smiling. Jean-Marc is said to be contemplating two climbs up the Matterhorn and one flight down by hang glider in 24 hours, so the experience hasn't put him off.

Commiserations, though, to Ashley Doubtfire, Dave ('marching to a different drum') Kirke and others who leapt off Kilimanjaro and didn't even get a valour nomination. Somehow, the timing has to be right. Get it wrong (and how can you know?) and it doesn't have the impact it should have.

**Brian Milton**

## REPORT IT!

On February 9th, there was a serious accident in which a pilot was injured. That happened on a Saturday afternoon, but no-one official — which means John or Judy Hunter, or Tony Fuell, or Chris Corston, or Reggie Spooner, or, I believe, the local accident co-ordinator knew until *Sunday* afternoon. This just can't continue. If we get chased by the Press on Saturday night about an accident, and we don't know from experienced pilots what happened, we will get our legs cut off. There's nothing so lame as standing there listening to heavy questions from a reporter who knows more than you do. If you are around an accident, whatever your state of shock, make sure someone official knows about it. Get the NEWS into the system.

## SUTTON BANK, NORTH YORKSHIRE

A committee has been formed of two members from each of the North Yorks Sailwing Club, George Cayley Sailwing Club and Dales Hang Gliding Club, to be responsible for *all* hang glider flying at Sutton Bank. Please contact the Secretary of any of the three clubs involved to find out the current position before flying there. Any flying without prior approval could have repercussions at local and national level and affect our flying at our gliding club sites throughout the country, so please be careful.

## SECOND FATALITY 1980

On Sunday, February 10th, at about 5 o'clock in the evening, while top landing a new glider, 50 year old John King stalled in at the Asterton end of the Long Mynd, and died on the way to hospital.

John was flying a Skyhook Silhouette, and soaring in a fresh westerly wind at the end of a good flying day. It was getting dark when he opted to land back on top, although there was still plenty of light to see by. The Mynd is a long ridge running roughly north/south, and there was a very slight southerly aspect in the wind. John came in, cross-wind tracking, from the north, but went way back from the front of the ridge, over the road. In the normal way of landing, he should have turned RIGHT back into wind, and come down reasonably gently on one of the best top landing sites in the country. Instead, and this will be the main aim of the official investigation, which is being conducted by DIANE HANLON, John made the long way turn LEFT, *downwind*. The kite, according to witnesses, came back into wind with its nose down and dropped from about 30ft.

This is NOT an official accident report, but journalistically correct. The accident looks like a classical case of pilot error. Any hang glider, flown too slowly behind the front of the ridge, will stall. The tragedy is that a fall from such a relatively low height should kill.

## BIZARRE ACCIDENT

Don't mix it with Jeremy Fack! At the end of January, he and his identical twin brother John, out in a pub after a day's working, were playing around arm-wrestling. After taking a number of opponents, Jeremy took on JOHN . . . AND BROKE HIS ARM! It wasn't just a simple break either. The arm was badly broken, and John will be off flying for months. So, for the next few months you can tell the difference immediately between John and Jeremy . . . Jeremy has a rueful smile . . . Further, John's Lazor arrived from the USA the day after the accident!

## BROTTON, NORTH YORKSHIRE

The land-owner has agreed to our using this site for a further year but is anxious not to disturb the few game birds which breed on his land close to the take-off point. He has asked us NOT to fly the site through the whole of May.

## HANG GLIDING

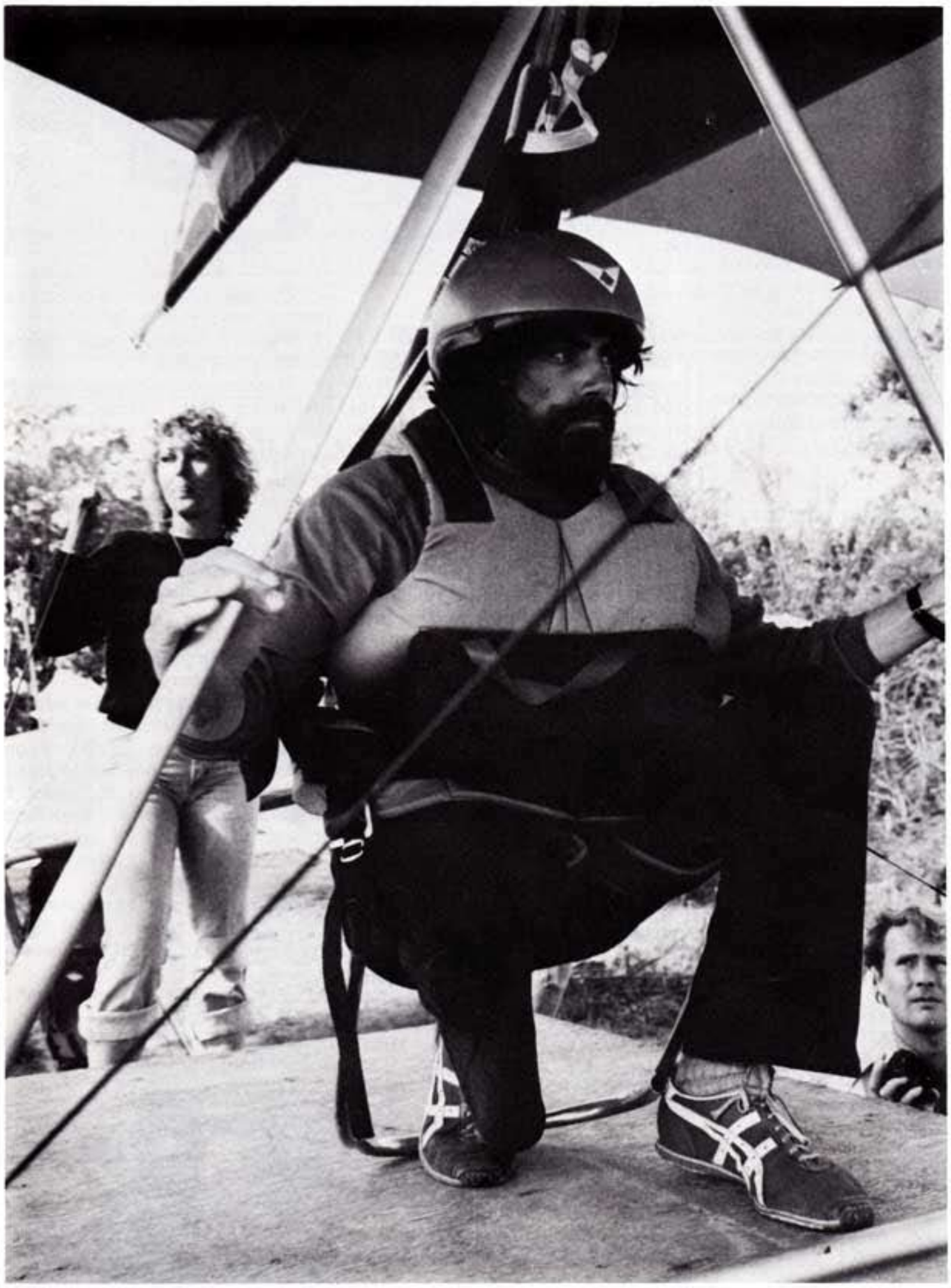
**JEAN-MARC BOIVIN**

Jumped with a hang glider from a record 7,600 metres off K2 mountain. He carried his own pack weighing 20 kilos for the entire ascent. Due to exceptionally bad weather conditions, Boivin developed permanent eye damage, and lost 7/10ths of his sight on the way up.

The ascent up a previously unconquered face of the mountain took four months and left Boivin seriously debilitated and exhausted when he made the jump. Able to see only a vague outline of the terrain, Boivin's speed was 80mph during the first 7 seconds of the fall, the speed levelled out to 50mph and he landed 13 minutes after he jumped at a speed of 25mph and broke the world record for altitude flying by hang glider.

*NOMINATED FOR INTERNATIONAL AWARD FOR VALOUR IN SPORT — gold pendant prize, worth £5,000.*
*Result - February 5th, 1980.*

**STOP PRESS! He received the prize! Congratulations!**



## CAN WE BEAT THE BLACK DEATH?

Two weeks before the EUROPEAN CHAMPIONSHIPS, Mike de GLANVILLE is running the Lachens XC Open in the South of France in which a maximum of 40 pilots will try and beat the 1979 Lachens champion, Australian PETER BROWN ("The Black Death") at open distance, goal racing and out and return.

The competition dates are June 9/15, with practice days 7/8. Lachens has a 5,000ft take-off, flyable in all directions, where the best height gain to date is said to be 10,500ft, and the best distance 41kms.

Cameras will be used on distance and turn points. There are chauffeur-driven recovery vehicles available, and a well-tried phone recovery system — 20 francs (approx. £2) per recovery.

Entry fee, 100 French francs, parachute obligatory. Entries should specify pilot/glider combination, and detail previous XC experience.

Last date for entries: May 9th, 1980.

Enquiries to: Mike de GLANVILLE, B.P. 35, 06370 Mouans Sartoux, France.

Telephone: 010-33-93-75-70-95

## COMPETITION
## Ireland versus Wales

The Irish are coming over mob-handed during the Spring Bank Holiday, May 24/26, to take on the Welsh. Ireland means just that, North and South together, but to fly for Wales you have to have been a member of a Welsh Federation Club for 3 months. Tasks will be set on each day for all entrants to compete individually for the Celtic Shield. The International Team event will be decided on the best five scores in each task . . . no teams are picked, everyone competes, but the team result 'emerges' at the end.

The venue will be Aberystwyth, there's to be a shindig on the Saturday night, and somewhere in the middle the sweaty figure of Bob McKay is involved. Details from 83 Wern Road, Skewen, West Glamorgan.

## BLERIOT CUP DATES

The French have proposed August 9th-17th for the 8-man team XC Anglo-French Championships, The BLERIOT CUP, which last year, remember, was a draw. The site will be the same, Lachens Mt. Providing the BHGA Competitions Committee agree, that means the 5th League date will be August 2/4th, Sat/Mon., rather than 9/11th August. The Bleriot Cup, five days of XC competition with two days practice and two days spare, remains a two-nation competition for 1980, despite requests from some other countries to join in. The rules of team XC are still evolving.

## TOW MEET — FRANCE
## MARCH 9th, 1980

VOL LIBRE, along with the French Hang Gliding Federation, is organising a two-day meet on towing at Chateauroux — 150 miles south of Paris — on March 8-9th, 1980. "Hang glider pilots, winch manufacturers and European H.G. Associations representatives are welcome, to look at, try, and to compare different winches available, and to follow conferences on towing aerodynamics and practice".

INFORMATION — (English spoken!) — VOL LIBRE MAGAZINE, 3 Rue Ampere, 94200 IVRY — FRANCE. Telephone (010-33-1)-672-74-60. Ask for Hubert AUPETIT.

*Sean Dever organizer of 1980 Southern California League. Keel launcher is Cindy Moore, first woman to win 1 hour RAVEN award at Grandfather Mountain.*

# NEWS EXTRA

## DUNSTABLE HGC

Following the AGM, there's a new Dunstable committee. Dave Simpson has retired as chairman and gone on to concentrate on his towing interests.

Dennis Munn, secretary for the past two years, is now the chairman. Chris Ellison takes on secretary's position. There are two new committee members: Sally Hellens, social secretary, and John Fennell, club coach.

At the moment, Dunstable HGC is waiting for ratification of their application to continue to fly in the London Gliding Club's ATZ for 1980. (This is a condition of the bye-law they fly under).

The DHGC hasn't been able to extend its flying limitations with the LGC but say they do have a flexible understanding with them.

Membership of DHGC stays at £7 a year, £3.50 per half year. Temporary membership — one week — costs £1.

Most visitors appreciate the need for discipline at Dunstable and the club appeals to all pilots to continue with this attitude when visiting their one (hill) site.

Further details: Chris Ellington, 60 Luton Road, Chalton, Luton, Beds. Tel: Toddington 2620.

## MERE — SPENCER'S BOWL

Continued use of this Avon H.G.C. site has been jeopardized by non-payment of site fees, and is now on approval for a year's trial period only. If you fly, and have not paid on the spot, send the money (£1 per flying kite per day) to the Hon. Treasurer, John Curtis, 34 Maypole Ave., Thornbury, Near Bristol.

Failure to reimburse the farmer pro rata with usage will result in this site being lost.

**Roy Bennett**
**Sites Officer**

## WATER LANDINGS

Mrs Elizabeth Baker, who's a National Tutor for the Royal Life Saving Society, is interested in the experience of any hang glider pilot who has landed in the water. After watching the Dover and Folkestone Club flying last summer she wants to write a thesis for the Royal Life Saving Society on water landings. (!) It's probable that she'll end up with recommendations for lifeguards and inevitably, us, when she's finished. If any of you have experience of water landings, Mrs Baker's address is DOLL'S HOUSE, Barnsole Road, Staple, Nr Canterbury, Kent.

## GORDON WEED

Tom Yeomans, from the Northampton HGC, writes that one of the club's founder members, Gordon Weed, has died of a heart attack at home. Gordon taught many of the local club to fly back in 1973/74. Tom says Gordon was a dedicated flyer who kept up his interest in hang gliding after a heart attack two years ago, though for 18 months he stopped flying. He started again 6 months ago after being passed fit. Gordon edited the Northampton HGC magazine and travelled all over the place to get news of flying. He'll be sorely missed.

## IRONY

Milton's children, who (were said to have) disrupted the 1979 AGM, were to have been caged up in a creche this year by a thoughtful MERCIAN club, reacting to 5 separate motions begging for such facilities. The sight of Reggie being heckled by Milton minor brought tears to the eyes of strong men. Now the creche is here, the brats have gone off to Africa! No consideration . . .

## PARITY

Following a recent international meeting, you can now earn gliding badges in a hang glider. Our standards have always been their standards (Delta Silver equals Silver C — 50km flight, 5 hours, 1,000 metre height gain) but our badges have been different. Now you can earn *their* badge, even if you have to be 50 times more skilful to do the distance on a hang glider.

## WAR OF ROSES

Yorkshire and Lancashire — two areas of the country which claim dominance in XC skills — are to sort out which is king. The ROSES competition takes place in the Yorkshire Dales on May 3rd/4th. There will be teams of 8, plus 2 reserves, and it's either one-on-one, or go-for-it XC, adding up the team's mileage (to lowest half mile). Robert BAILEY is team captain Yorkshire, and he will pick a team from Pennine, Dales, North Yorks, Cayley and Sheffield clubs. Bob CALVERT is team captain Lancashire, but there's no news yet on where he's getting his pilots (rumour has it that Johnny Carr, Bob England, Jeremy Fack, Mark Southall and Nigel Milnes are all taking elocution lessons, reciting ILKLEY MOOR B'AT HAT in a strange foreign tongue).

The Roses Competition will be an annual event, and should promote some big mileage flights (writes Rob Bailey) "from the top pilots in the UK, i.e. Yorkshire Pilots".

The winning team will be presented with a sculptured EAGLE — made by Lucy D. Bailey, Robert's sister — from steel.

Details: Leeds 662518 for Yorkshire, Blackburn 21615 for Lancashire.

## THE DALES CLUB PARTY
## January 18th, 1980

As well as being a thoroughly pleasant social occasion, the Dales Club used the Annual Buffet Dinner as the opportunity to extend their hospitality to the farmers and graziers who occupy their flying sites.

At the Cow and Calf Hotel on the edge of Ilkley Moor, Farmers and Flyers alike enjoyed a superb meal followed by a hilarious and occasionally ribald slide show of Club activities during 1979, presented by Pete Anstey (Secretary) and Geoff Marsden-Jones.

Trevor Birkbeck then operated the disco, and during the evening organiser Brian Dobson's wife, Kristine, was presented with a bouquet of flowers.

A tombola raised £30 for Club funds, Geoff Marsden-Jones received the "Cock o' the Dales" award as the most improved flyer of the year, and Noel Whittall assisted committee member Tim Taft to consume his prize bottle of Scotch.

*Top Table: l. to r. Pete Anstey, Brian Dobson, Rosita Whittall, Noel Whittall, Jane Taft.*
*Foreground: Harry Unsworth, John Doré, Delia Doré.*

## XC LEAGUE
## from Dave Harrison

*I am 25, a Design Draughtsman. I bought my first kite, a SKYHOOK IIIA, in October, 1976. On this I taught my brother — Bob, one of the American Cup team — to fly. Some time later, he taught me to fly. I came 4th in last year's SCOTTISH OPEN — which Bob won — and my longest XC to date is 23 miles.*

All flight must be made within Great Britain — or for the more ambitious, must at least start or end in Britain. A flight may be undertaken anytime from anywhere.

A table will be published periodically in *Wings!* which will contain the best three flights, and the average of these three, for each entrant. The average will be the "score" and pilots will be positioned in numerical order.

You'll also be asked to write an article about your flight which may appear in *Wings!*

ENTRY REQUIREMENTS — The only requirements are Pilot 2 (or equivalent) and membership of the BHGA.

NOTIFICATION OF XC FLIGHT: Send the following information to Dave Harrison after each flight: DAVE HARRISON, MILL RIGG, CROSS LANE, N. FRODINGHAM, DRIFFIELD, NORTH HUMBERSIDE, YO25 8JY.

(a) Your name and address
(b) BHGA Membership No. and Club
(c) Date of flight and approx. time
(d) Distance claimed in kms and miles to nearest 0.1
(e) OS map reference of launch and landing, not forgetting Map No.
(f) Name, address and phone numbers of witness
(g) Weather conditions, including lift details, e.g. wave, thermal, sea breeze
(h) Equipment used

TABULATION — A pilots XC League position will be decided by the average of his best three flights, this being uprated when a better than average XC is flown.

The table will start afresh each year and run from January 1st to December 31st.

The CLUB XC LEAGUE will be determined by the average of the best four club members.

If less than three flights are achieved a zero will be inserted for each absent flight. If, for example, you do only one flight of 50 miles, your "score" is still the average of 3 flights, 16.7 miles. If, on the other hand, you did three flights of say, 18, 20 and 24 miles, your average is 20.7 miles, obviously better. It is consistency we want.

This League will move with the times. Out and returns, Goal flights, etc. could be included if they become popular.

Flat land pilots take note; winch launches are acceptable.

Good Luck! Happy flying! We hope to hear from you soon.

# THE 1980 ARBEE COLLECTION.


OUR NEW VARIO. £97.00

SELF ZEROING (NO ZERO CONTROL). AUDIO AND VISUAL. MOUNTED ON A STALK. EXTREMELY SENSITIVE. AUDIO ON UP AND DOWN - DIFFERENT TONE FOR UP AND DOWN. THRESHOLD AT WHICH UP AUDIO CUTS IN MAY BE VARIED FROM 0 TO 300 FT/MIN.

OUR NEW VARIO/ALTIMETER. £168.00

THE SAME VARIO AS IN THE ABOVE UNIT BUT FITTED WITH 240° METER FOR EASIER MORE ACCURATE READING. FITTED WITH DIPLEX ALTIMETER - 0 TO 8000 FEET/SWEEP.



OUR WELL PROVEN A.S.I. £69.00

SHOWN HERE FITTED TO THE STALK OF AN INSTRUMENT POD. CAN BE SUPPLIED AS A STANDALONE INSTRUMENT FOR DIRECT FITTING TO CONTROL FRAME OR ADAPTED TO FIT EITHER OF THE ABOVE INSTRUMENT PODS. INCLUDES AUDIO STALL WARNING INDICATOR.

ALL INSTRUMENTS ARE FITTED WITH A LOW BATTERY WARNING INDICATOR. STATE 1" OR 1⅛" CONTROL FRAME WHEN ORDERING. SEND CHEQUE OR P.O. TO :-

ARBEE DEVELOPMENTS, 18 STEPHENS CRES., HORNDON-ON-THE-HILL, STANFORD LE-HOPE, ESSEX.

# NEWS EXTRA

## THAMES VALLEY CHARITY FLY-IN

Thames Valley HGC set out to hold a charity fly-in to help the local hospitals. By any standards, they were tremendously successful. In all, £1,127.09½ was raised, including £233.88 from TVHGC's chairman, Ron Jerome, and his family. The club has presented a communicator to the Speech Therapy Unit at Battle Hospital (cost — £295.00) and another more sophisticated machine — costing £450.00 — was presented to the same hospital. A Slough Hospital got the third machine.

In reply, the club got the transcript of a message from Mr. E.C., who was given the communicator . . . "Thank you every one concerned with getting this communicator for me with all my heart. Thank you once again". This man was completely unable to communicate before he received this machine which greatly improved the quality of his life. NICE ONE THAMES!

## SHEFFIELD SITES

Because of tightness at both top and bottom landing areas at MAM TOR and LORDS SEAT, visiting pilots are asked to provide proof of ability in the form of a PILOT 2 badge or equivalent before flying these sites. Please contact the Sheffield Hang Gliding Club Ltd., if you wish to fly in the Sheffield/Peak Park area. Membership details — both associate and full categories available from Ronnie Zarowski, 121 Eccleshall Road South, Sheffield 11. Telephone 0742-366166

## PILOT RATING SYSTEM ENTRY CHARGES

These are to be raised in the very near future. Members who qualified as "Pilots" or who still have uncompleted "Pilot" task forms under the Old System currently pay £1 to transfer into the New System. Those intending to do so are advised that after the end of March the amount will double. When writing in don't forget to send your name, address, "Pilot" number or old "Pilot" task form and your Membership number.

## MEMBERSHIP SECRETARYSHIP

Lynne Whitcombe found the sheer pressure of work that the job involves was more than she was prepared to continue with. She is well qualified for a lot of other Clerical/Secretarial jobs that pay better and involve less hassle. Janet Hayes has been trained by Lynne for a few weeks and has now taken over the job. Janet is the wife of Mick Hayes, our first Treasurer, and was our Membership Secretary for over six months during 1975 and early 1976. She also handled enquiries and forwarded mail for a far longer period from the original "Monksilver" address.

Thanks and Goodbye Lynne, Welcome back Janet.

## OXYGEN — RESPONSE

In response to Dr. Dunstan Hadley's article in *Wings* February, 1980 we would like to point out that there is a very suitable oxygen system available for hang glider pilots.

Produced in the United States, the system is called the Mini-pac and consists of a 7 cu. ft. cylinder, a regulator and a face mask. The cylinder is a 4½in. diameter × 14in. and weighs 6lbs. Connected directly to the cylinder is the air flow regulator. This is a two-part regulator, one half of the dial showing the contents of the cylinder and the other half showing the height in feet. It's calibrated from zero to 35,000 ft. so hang glider pilots should not have any problems. The small circular valve adjusts the flow rate of the oxygen which can be set to whatever altitude you happen to be flying, i.e. setting the valve at 10,000 ft. gives X amount whereas setting it at 15,000 ft. gives a greater amount. The valve is adjusted as you either gain or lose altitude.

The regulator is not a 'demand' regulator. The oxygen flows freely into the face mask and you breath this continuous supply. The cylinder has enough capacity to give about 1½ hours flight at 15,000 ft. which should be quite sufficient for most hang glider pilots. The unit can be clipped to the control frame upright by simple strap clips.

Mini-pac oxygen systems cost about £120 here in the UK and are readily available. Dr. Hadley's suggestion of height gain competition is most interesting, but since oxygen requirements usually start at 10,000 ft. and the very maximum that anyone has gained in the UK is round about 6½ to 7,000ft., I rather feel that finding a sponsor to sponsor such a competition would be a most difficult task. However, Mainair Sports will join in the fun of this and present a brand new Mini-pac oxygen system to the first pilot in Britain to reach an altitude of 10,000 ft. on a hang glider after either a winch or foot launch take-off. This contest will be open for one year.

**John Hudson**
**MAINAIR SPORTS**

## ROD SURRAGE

The appeal for injured flyer, Rod and his family brought in cheques for just over £300.*

## STOP PRESS

*On the 5th February a batch of cheques arrived, totalling £170, from Rod's friends in Guildford. So now the amount raised is approaching the £500 mark.

## VORTEX MODELS 120 and 110 — WARNING

*by Mike Collis, Chairman, Accident Prevention Committee*

The following defects have been reported on Chargus Vortex 120's (one glider only in each case).

**Lower Rigging Wires (120 and 110)**
The very short length of wire between the second swages of the strap which connects each pair of control frame tong plates had broken strands. Avoid bending this wire when the glider is unrigged. The maker has an improved design available as a modification.

**Cross-boom Inserts (120 only, not fitted to 110)**
The ⅛ in. pop rivet securing each internal sleeve to its boom has been sheared by dropping battens etc. down the booms. The sleeves had moved outwards, weakening the booms.

**Chargus state that:**
(a) Booms are not to be used as stowages.
(b) The D.I. Inspector is to include a particular check on the short lengths of wire and on the presence of the rivet heads.

## THE CENTRAL FIGHTING FUND

A few more cheques have been received and we acknowledge donations from HMS Dolphin, Simon Murphy and the South West Wales HGC.

The fund is just nudging the £1,500 mark and the Secretary is almost certain that all donations received up to the end of January have been acknowledged. If anyone has been missed please contact him.

## DARTMOOR COMMONS BILL

Situation at the end of January. David Bedding has had to withdraw as the Associations Parliamentary Agent on the insistence of his employers the DOE. A BHGA delegation met Devon County Council officials during January but could not get reference to our Sport removed. At the meeting it became obvious that the Devon County Council and National Park Authority had promised to seek powers to control us and other minority users in return for the Commoners co-operation. Ewart Jones has been appointed as our Petitioner. Meanwhile we are standing by to circularise all MPs and will be calling on Club Secretaries and others who have offered their services to actively lobby MPs for support at a Second Reading Debate if necessary.

The Bill faces opposition from several quarters and in an effort to avoid it being delayed for a long time the Parliamentary agents for the County Council are negotiating. Patrick McNair-Wilson MP is doing all he can to help us for which he has our thanks. We await developments.

*'Unreal'* *(by John Wa[illegible] and Bob Fisher)*

## DARTMOOR COMMONS BILL

**Dartmoor — Several hundred square miles in S.W. Devon**

**Object: To remove the reference to hang gliding in the bill**

MPs are considering a Bill which would drastically reduce the rights of the public to the use of Dartmoor Commons. Amongst the restrictions proposed is a ban on hang gliding, which the BHGA is fighting by lobbying parliament.

BHGA has registered a Parliamentary agent to put the case against the bill.

The crux of BHGA's case is . . . "There are only 27 members of the Western Counties Club, which uses Dartmoor. There are few visitors, or spectators. It is rare for more than eight flyers to be active even on a Summer Saturday, and that would be on one of the six sites where there are agreements with landowners. There have been no problems" . . . BHGA Secretary, Chris Corston.

We feel we're a pawn in this whole matter of bringing the Commoners — those militant commoner associations which want almost total power over the use of common land — into a reasonable framework. We object to this . . .

## FLEXIFORM

Dear Sir,

We would like to take this opportunity to inform all members of the BHGA and BHGMF of the new address of Flexiform Skysails.

We have acquired fresh premises located in Beddingate Mill, Leigh St., Patricroft, Manchester, which is only 300yds. from our old premises.

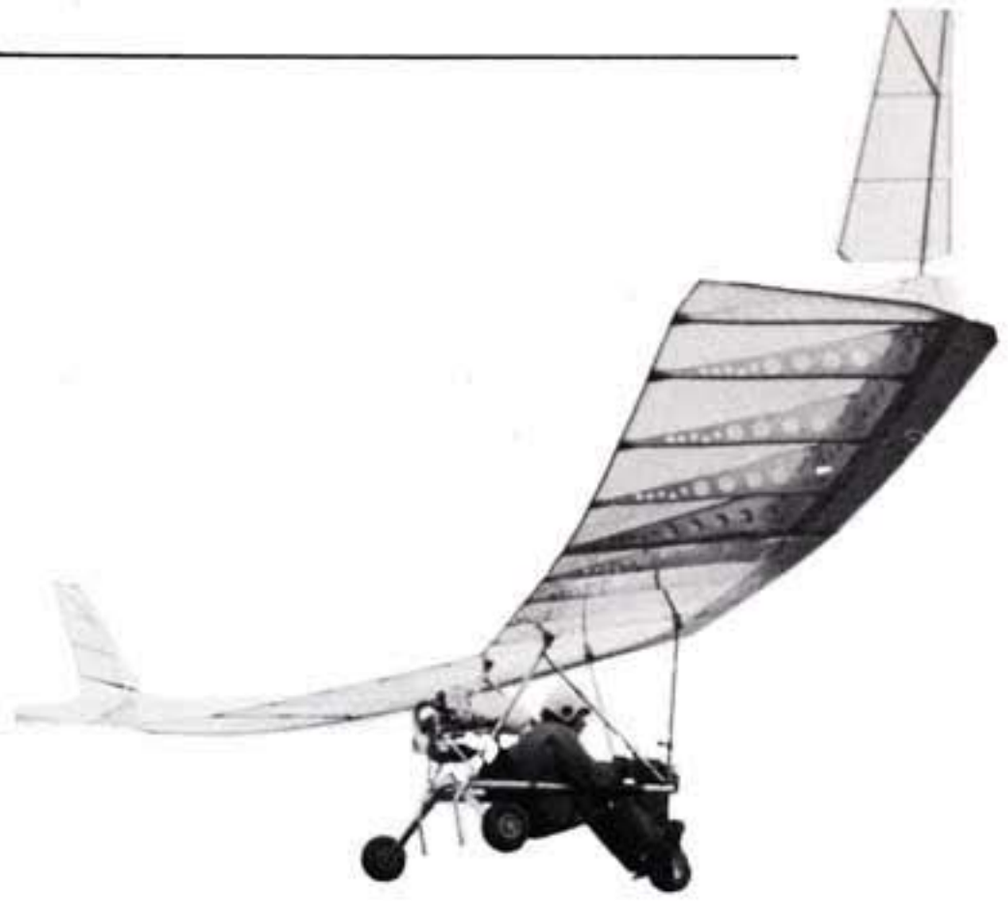
The new premises have greatly improved parking facilities and will enable us to extend our production capacity and service facilities, and shorten our delivery period.

Our telephone number will remain the same (061-707-1389) so we would like to welcome customers, past, present and future, to call and see us sometime.

**Hughie McGovern**
**Mike Hurtley**
**The Flexiform Flyers**

## YORKSHIRE

*"North Yorks. Sailwing Club memberships have now expired. 1980 Membership Fees are due. Full Membership — £10, Associate Membership — £8, Visiting Membership — £2 per month. Anyone wishing to join is to write to me: G.S. Stapleton, 12 Low Church Wynd, Yarm, Cleveland."*



Dennis Richards has bought a kit for a CA15, produced by CATTO Aircraft of America. He's built and successfully flown it. The first flight took place on December 30th at Kirkbridge, in Cumbria, a disused RAF aerodrome. To date, he has had about 10 hours flying time on it, with flights around the countryside of up to 15 miles. These have been made at heights of up to 2,500 feet. Take-offs and landings are now being successfully performed from ordinary fields. The climb rate, he says, appears to be reasonable.

The photos were taken at Kirkbridge aerodrome before Dennis had transferred his flying to fields closer to home.

## TOM PEGHINY and his new EAGLE

TOM PEGHINY is almost the original blue-eyed boy. He must be about 25 now, and once won the US Masters of Hang Gliding Competition. Everyone who knows him, likes him . . . the nearest I have ever heard him come to a nasty word was an oblique reference to the small number of Californians who, in 1979, chose the American team for the AMERICAN CUP — he wasn't in on selection, and like others, he thought he might have been.

JOHNNY CARR tells a story about the 1975 World Championships in Kossen in which all the legends were actually there for him to fly against. Tom wasn't in the American team, and Johnny used to look at him from a distance, and whisper proudly, "that's Tom Peghiny", but never had the nerve to go and talk to him. Tom was almost outraged when he heard the story years later.

The EAGLE is Tom's latest creation, seen here — photographed by Bettina Gray — flying at America's Rhossili, Torrey Pines. All the rucks in the sail don't look too good, but compare where Tom thinks hang gliding is going with the drawing by Everard Cunnion in February *Wings!* There's a big similarity. Tom has gone for a tail, while Everard went for a canard. Two or three years from now, maybe a bit longer, you'll be looking back and saying . . . WHO? . . . was right.

*photo: Bettina Gray*

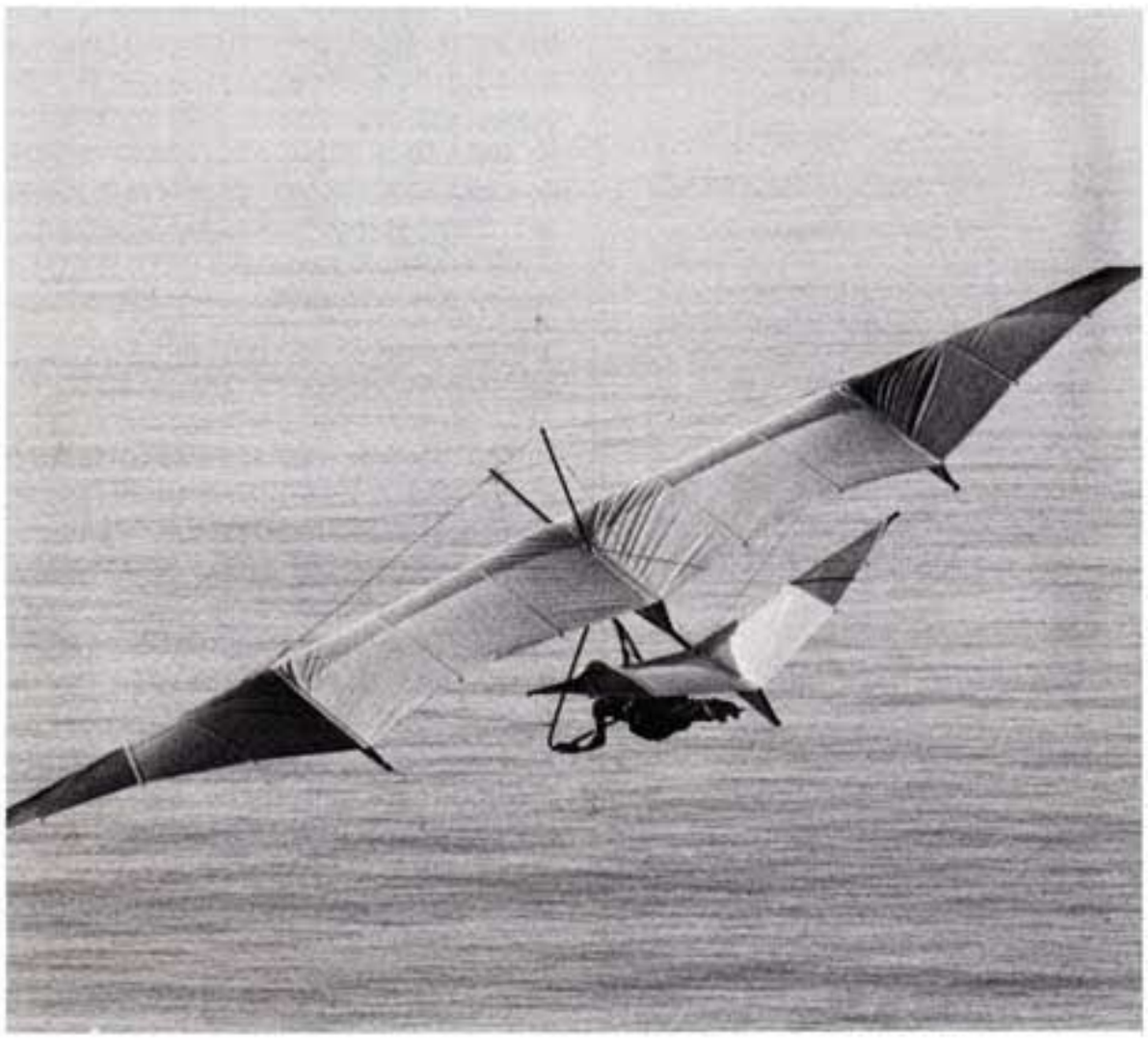
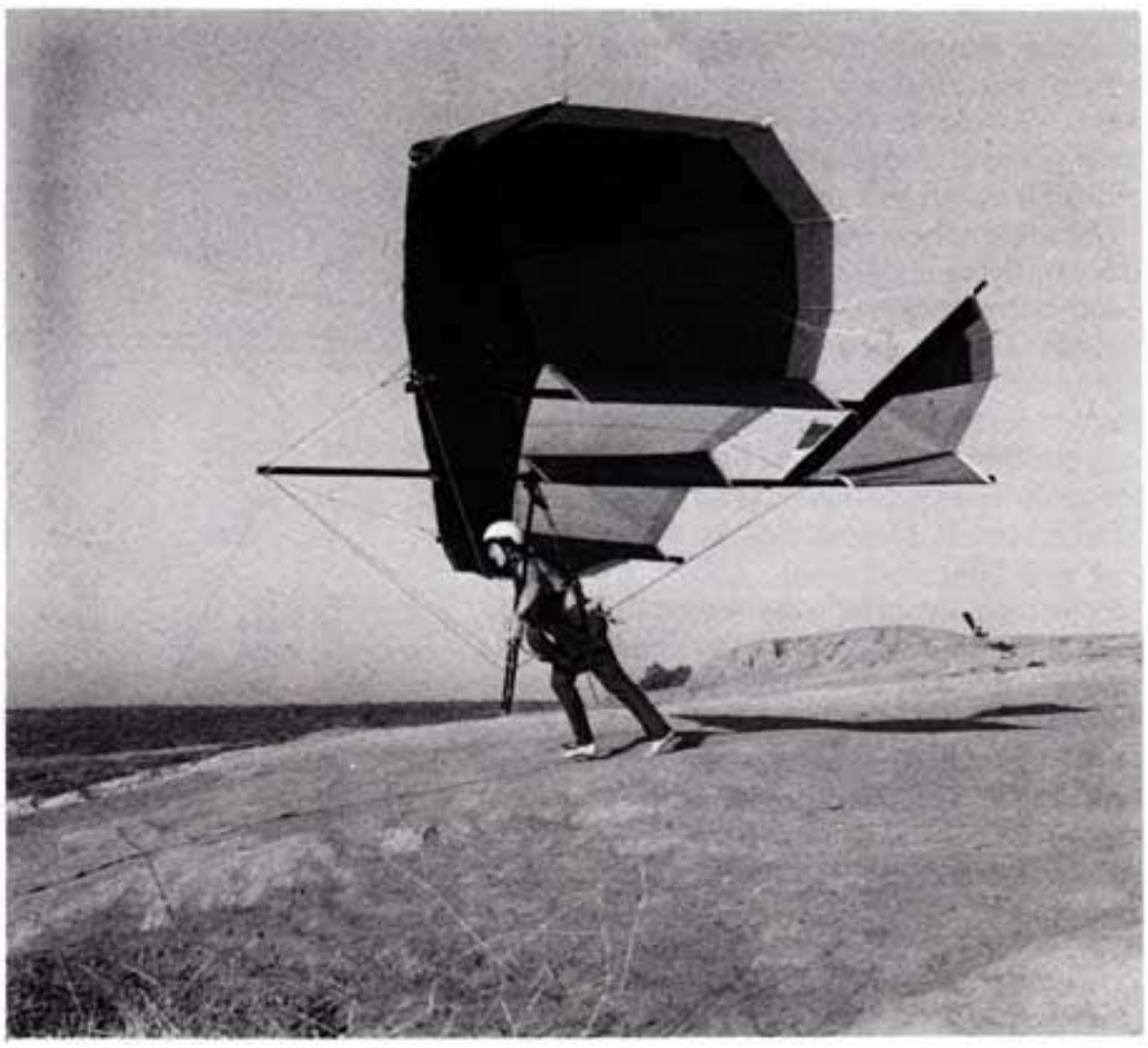
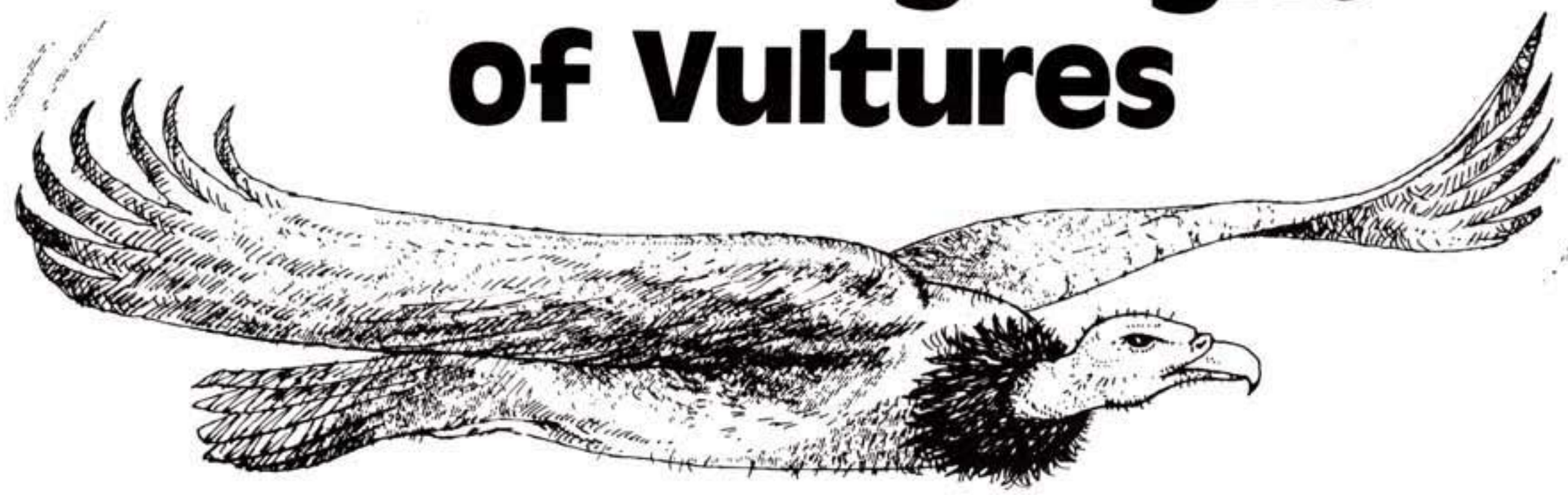


*photo: Bettina Gray*



# The Soaring Flight of Vultures



**Three years ago, pushed to say where hang gliding was going, I made the prediction that — in five years time — we would be able *to migrate* on a hang glider. It may have sounded a desperate prediction, but the reason I made it was an article in *Scientific American* by C.J. Pennycuick, on the soaring characteristics of vultures, part of which is published here.**

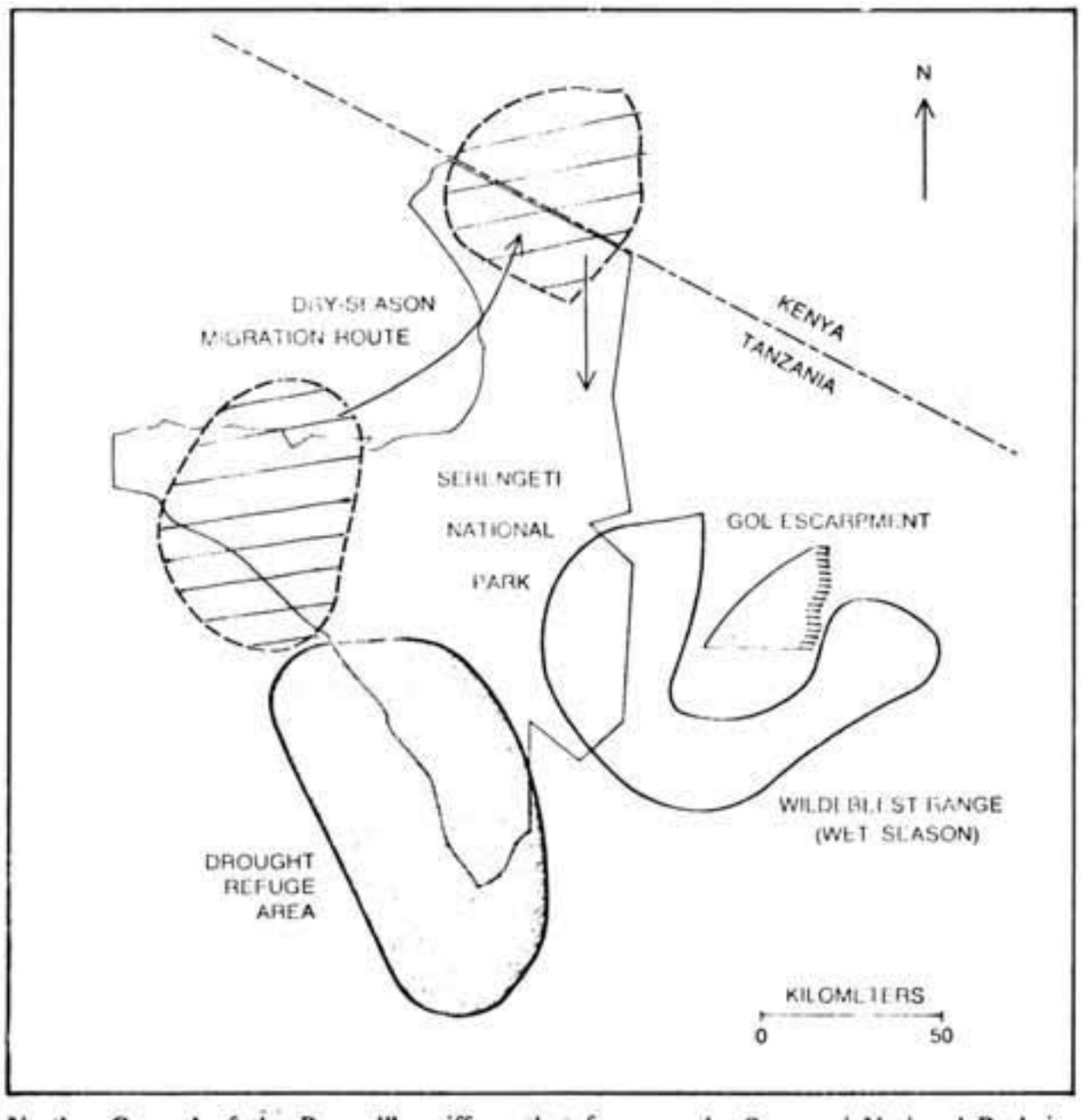
**The fascinating conclusion I think you'll all come to is the similarity between birds like the *Hooded Vulture* and the performance of a hang glider. As an exercise, would anyone be able to plan a possible route from Northern Europe to Africa, using prevailing winds and weather conditions, and calling on the accumulated knowledge of an expert on the European White Stork? Obviously, the storks leave for Africa in the Autumn, but how do they travel? What routes across the Mediterranean? What about the Sahara? If such an unpowered flight *is* in the future, it would be worth starting now to find out which way to go about it. First, though, Mr Pennycuick's conclusions on vulture flight. . .**

**The six common vultures of East Africa can make a round trip of as much as 200 kilometres by skilfully riding updrafts.**

To watch a vulture soar effortlessly overhead for hours at a time is to become convinced that these birds are among the most skilful of flyers. Yet there are occasions when vultures cannot fly at all. Early in the morning on the East African plains one quite often meets little groups of vultures that had gathered at some small find the night before and then slept where they happened to be when night fell. If the birds are pursued, they take off, but they do not fly far before they land again. If they are forced to take off several times in rapid succession, they quickly become exhausted and can be caught by hand. Two of the commonest East African vultures, Ruppell's griffon (*Gyps ruppellii)* and the white-backed vulture *(Gyps africanus),* can easily be caught this way. Later in the morning, say after about 9 am., the technique sometimes still works on a vulture that is heavily gorged with food. More often the bird will fly straight ahead for a short distance, then turn sharply and at the same time start climbing. After turning in a few irregular narrow circles and intermittently flapping its wings, the vulture settles down to gliding in steady circles. It then continues to climb without flapping its wings and drifts downwind as it circles.

The reason these vultures have such difficulty flying under their own muscle power is that they are too big. There is a relation between the power required to fly, the power available from the muscles and the body weight that sets an upper limit to the weight of animals able to fly by muscle power. The larger vultures, storks and pelicans are quite near this limit and would barely be able to stay airborne were it not for their ability to extract energy from the atmosphere and use it for their locomotion.

Soaring techniques can be classified according to the atmospheric process responsible for the rising air, or "lift". The existence of lift in sufficient quantities, however, satisfies only part of the requirement for a successful soaring technique. Sufficient information must also be available to the bird to enable it to locate the lift and, having found it, to carry out the correct manoeuvres to make use of it. If the bird executes the wrong manoeuver, it will usually lose the lift.




**Nesting Ground** of the Ruppell's griffons that frequent the Serengeti National Park is the Gol Escarpment *(right),* a zone convenient to the grazing area preferred by the wildebeest in the wet season when the griffons are raising their nestlings *(light colour).* An unseasonable drought, however, will move the wildebeest to the west *(dark colour),* forcing the griffons to travel 100 kilometres in each direction to get food for the nestlings. In the dry season, during the annual wildebeest migration *(striped zones),* the griffons follow them.

### Three Lifts

A soaring bird can work with several different kinds of lift, for example slope lift, in which the air rises when a wind encounters a slope; thermal lift, in which columns or bubbles of air rise when heated from below by warm ground, and wave lift, in which the air rises in the course of undulatory motion downwind of an obstacle. The correct procedure for a bird using slope lift is for the bird to tack to and fro, remaining above the windward slope. If the lift happens to be due to a thermal, however, the bird must change over to circling, drifting downwind with the thermal instead of remaining over the slope. Wave lift, on the other hand, remains stationary with respect to the ground, and it must be worked in the same way as slope lift, except that there is no slope to indicate where the lift is. Inexperienced glider pilots often mistake wave lift for thermal; they circle in it and as a result drift downwind into the downgoing part of the wave. This error is apt to lead to a rapid and embarrassing descent *aux vaches,* as French pilots say. Present indications are that many, if not all, birds make the same mistake when they encounter wave lift.

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**The Author did his research in a motor glider, mainly over the Serengeti National Park in northern Tanzania and neighbouring areas of Tanzania and Kenya. This area enjoys good soaring weather throughout most of the year, and it is frequented by a remarkable variety of species of soaring birds. Many of the birds are common enough to be encountered during nearly every flight.**

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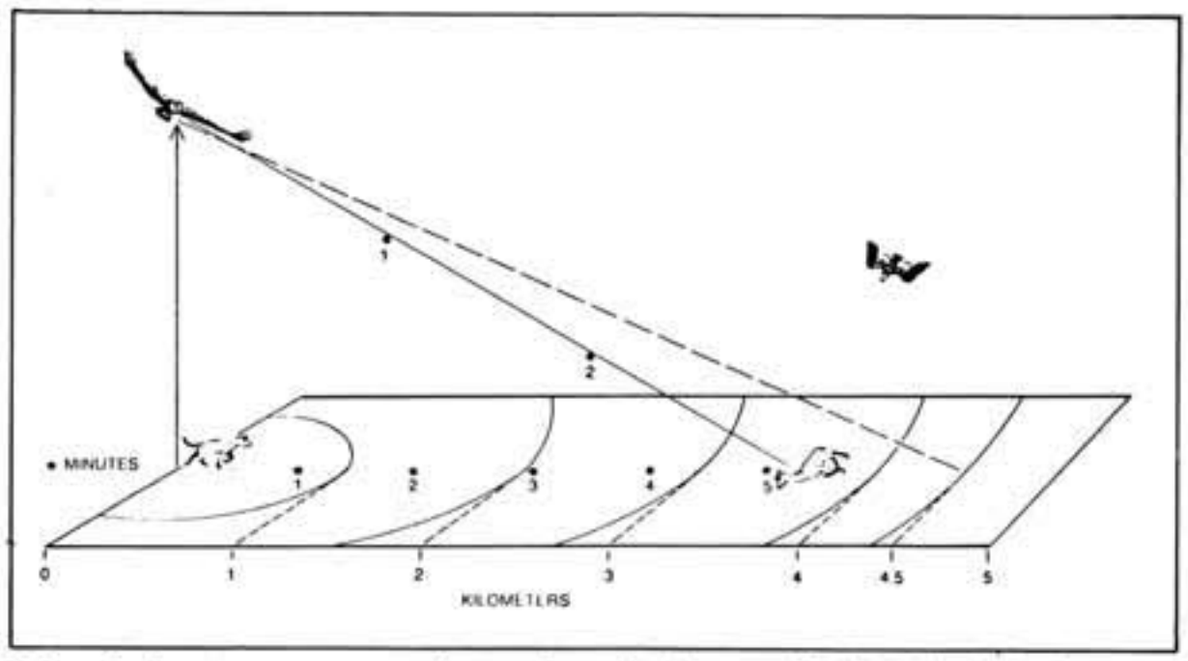
The common soaring birds of East Africa soar mainly in slope lift and

thermals. Slope lift is, of course, useful only in the hillier areas and at comparatively low altitudes, and so in general thermals are the most important source of lift. When vultures are taking off from the ground, one can see at once that they are using some definite structure in the atmosphere rather than the randomly distributed kind of energy characteristic of turbulent air. As soon as one vulture is climbing successfully it is quickly joined by others (and often by other kinds of birds as well), until soon a group of birds forms, all circling around a common axis. This axis marks the "core" of a thermal, which at low altitudes is generally a vortex of the "dust devil", or columnar, type. "Dust devil" refers to the fact that over dry ground vigorous thermals of this type are often visible as whirling columns of dust. Higher up vortex-ring thermals may form, and the tops of many thermals of either type are marked by cumulus clouds. As far as the soaring bird or pilot is concerned, either type of thermal can be considered a circular patch of lift that drifts along with the wind. The appropriate soaring manoeuvre is to fly in steady circles of as small a radius as possible, in order to stay as close as possible to the middle of the core, where the lift is strongest.

A bird's ability to use thermals, either for staying airborne or for travelling cross-country, depends on its gliding performance. This is most often expressed in terms of its "glide polar", which is a graph of sinking speed plotted against forward speed. The glide polar for a glider can be measured directly. The same type of graph for a gliding bird can be produced by estimating the differences in horizontal and vertical speed between a glider with a known polar and the bird. In this way the glide polars of the glider and the white-backed vulture have been compared.

In a straight glide the glider can travel much faster than the vulture at a given gliding angle. This is owing partly to the glider's superior aerodynamic efficiency and partly to its higher wing loading (the ratio of weight to wing area). On the other hand, when the glide polar is translated into circling flight, the effect of the vulture's lower wing loading is that it can turn in much smaller circles at a similar rate of sink. This means that in a narrow thermal the bird can centre its circle in the strongest part of the core, whereas the glider is obliged to fly in the weaker lift around the outside. Thus the vulture can often outclimb the glider, particularly at low altitude and early in the day, when the thermals tend to be weak and narrow, even though its sinking speed in straight flight is much the same. On one occasion, on a day of exceptionally narrow thermals, I was outclimbed by a tawny eagle (which has a still lower wing loading than the white-backed vulture), even though I had my engine running while the eagle was only gliding.

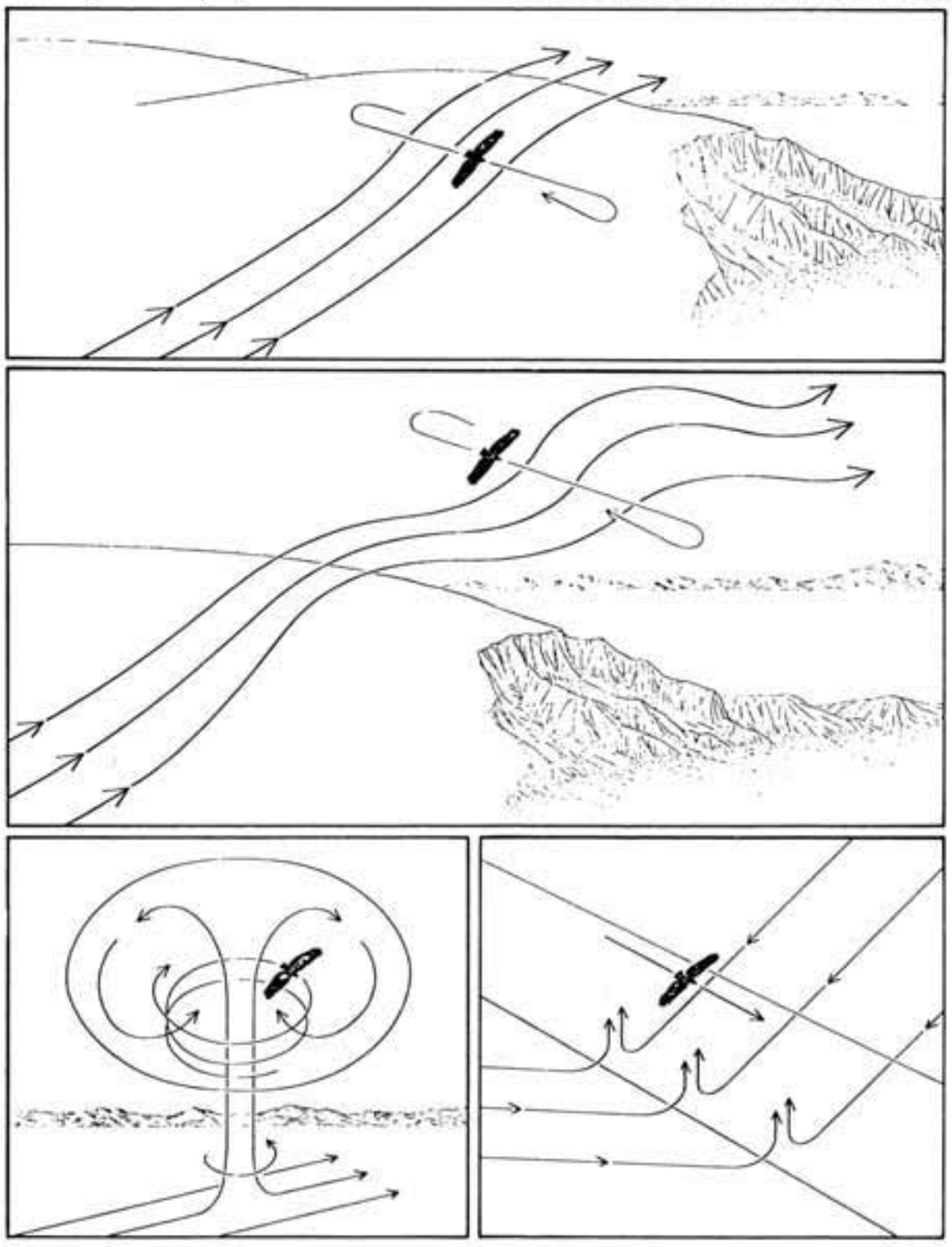



**Vultures' advantage** over scavenging quadrupeds when prey is sighted lies in being able to reach the carrion first. In this example the descent of a vulture in the distance *(right)* attracts the attention of a hyena and a lappet-faced vulture *(left)* to a carcass some 3.5 kilometres away. The vulture, targeting in at 70 kilometres per hour, reaches the carrion in three minutes, whereas the hyena, running at 40 kilometres per hour, needs 4.25 minutes to cover the same distance.

### Foraging Birds

Many birds of prey are adapted primarily to using thermals as a means of remaining airborne in order to look out for food below. The African martial eagle, which preys on other birds, uses thermals in much the same way that smaller eagles and hawks use a rocky crag or a telephone pole. When foraging, it climbs by circling in a thermal to some modest height, usually from 1000ft. to 2000ft. above the ground, and then glides slowly along with its head pointing down, looking out for prey below.

Vultures use much the same technique in searching for carrion, but their tactics are based on the need to arrive promptly on the scene whenever and wherever a dead animal happens to turn up. By alternately climbing in thermals and gliding straight in different directions, they patrol over likely areas, usually between 600ft. and 1600ft above the ground. Starting from a height of, say, 1000ft., a vulture can reach any point on the ground within a radius of about 4.5 kilometres within six minutes. Points nearer to hand can be reached more quickly in a fast, steep dive; the steeper the angle is, the faster the vulture can glide. The mammalian scavengers, mainly the spotted hyena react like the vultures to signs of activity in the distance (including the descending vultures), but they have to work much harder to get to the site and have lower maximum speeds. Thus the vultures, although they cannot drive off the hyenas in a direct confrontation, can still compete with them effectively through their advantage in arriving quickly at an unpredictable source of food.



**Four kinds of lift** are exploited by different patterns of flight. Where air movement uphill provides "slope lift" *(top)*, bird or sailplane should tack back and forth, heading sufficiently into the wind to stay within the same zone of rising air. The same pattern of flight is used to exploit "wave lift" on the leeward side of a slope *(middle)*. To exploit a "thermal" *(bottom left)* the soarer travels downwind with the rising air column, circling within the thermal. When two air masses converge *(bottom right)*, producing a line of "frontal lift," the soarer can either tack back and forth or set off in one direction and travel the entire length of the line.

### XC Griffon

The bird that travels farthest is Ruppell's griffon, which nests in colonies on cliffs. This habit, in which it differs from the white-backed vulture (a tree-nester), is most probably a reflection of the fact that, being mainly a bird of the arid country to the north, it is near the edge of its range in the Serengeti. The only suitable cliffs in the Serengeti area outside the national park are along the eastern escarpment of the Gol Mountains, and here some 500 or so pairs of Ruppell's griffons nest. Their breeding season is so timed that they normally raise their young during the period from February to May. This is the rainy season, during which the main migratory ungulate populations are usually on the Serengeti and Salei plains, within easy reach of the nesting cliffs. It often happens, however, that the rains are interrupted by dry spells, and wildebeest and zebras are then forced to move away to the south and the west. That may oblige the griffons to travel 100 kilometres or more each way to get food for their young, which have to be fed daily by one parent or the other.

By following vultures on cross-country flights I have found that in good soaring weather, which usually prevails when the plains are dry, they can keep up average cross-country speeds of some 45 kilometres (28mph). Thus they must travel two or three hours each way between the nesting cliffs and the dry-weather areas. In windy weather the vultures take off and start slope soaring along the cliffs at the first light. The prevailing winds are easterly, and by moving from slope to slope the vultures can make their way westward across the hills to the edge of the Serengeti Plain. There they have to wait for convection to begin (usually between 8 am and 9 am) before they can drift farther downwind across the plains by circling in the first weak thermals.

The best soaring hours of the day are usually between 11 am and 4 pm., when in dry weather frequent thermals provide rates of climb typically between 400ft. and 800ft. per minute over an altitude range from very near the ground (say 5000ft. above sea level) up to cloudbase (which is normally about 11,500ft. above sea level). A climb from the bottom to the top of this range usually takes ten minutes or so, after which the bird can glide off straight in the direction it wants to go.

The speed on the straight glides is typically between 70 and 85 kilometres (45 and 55mph). At these speeds the glide ratio is about 10:1, that is, the bird loses one meter of height for every 10 it travels forward. If it encountered no vertical motion in the air at all, it could glide some 18 kilometres in, say, 15 minutes before the need for another thermal became urgent. The total time needed to travel this distance, including the time for the climb, would be about 25 minutes, equivalent to an average cross-country speed of 43 kilometres per hour. In practice the vultures do not generally use the full altitude range available to them; they usually leave a thermal at between 8,500ft. and 10,000ft. above sea level. Moreover, they flatten their gliding angle considerably by slowing down as they fly through thermals and speeding up in between. On one occasion a Ruppell's griffon I was accompanying in the glider flew for 32 kilometres without circling by using this tactic and managed to lose only 520 metres of altitude — an achieved glide ratio of better than 60:1!

**Best of both worlds**

The biggest advantage low wing loading gives a bird is the ability to soar early in the day, when the first thermals are usually feeble dust devils, both narrow and weak. This advantage is important to foraging vultures: the earlier they become airborne in the morning, the better are their chances of getting pickings from the remains of animals that have died or been killed by predators during the night. In the heat of the day the thermals are broader and stronger, and the advantage in rate of climb to be had from a very low wing loading becomes insignificant; the beneficial effect on cross-country speed is more than offset by the loss of speed on the straight glides. To some extent birds achieve the best of both worlds, because they can reduce their wing area for fast flight. Even so the cross-country speeds they can achieve are modest compared with those of man-made gliders.

When the wing loadings of various birds are plotted against their mass on a double-logarithmic scale, the different vulture species segregate into two groups. The sedentary lappet-faced vultures and white-headed vultures have low wing loadings; they are specialised for being able to stay airborne in the weakest possible thermals. The griffons, being cross-country flyers, have compromised by having somewhat higher wing loadings.

**Cloud Street Vultures**

Even in strong convection currents neither a bird nor a man-made glider can afford simply to glide along in one direction, relying on chance to bring it to the next thermal. All too often the ground is reached before a thermal is found. Thermals are mostly invisible, except for vigorous dust devils, but it is possible to increase the chance of encountering one by flying under a growing cumulus cloud or over a ground feature that looks likely to warm up differentially in the heat of the sun. A glider pilot's skill largely reflects his ability to notice such things, which in turn is based on his knowledge of atmospheric processes. Vultures and eagles are very good at finding the best lift, and they appear to make use of the visible signs in the same way the glider pilot does. For example, a common phenomenon in East Africa is the alignment of thermals into "streets" that are marked by lines of cumulus clouds. Here the thermals can be so close together that a bird or a glider pilot can fly from one to another, without circling and without losing height, for as much as 80 kilometres. Vultures regularly fly along thermal streets, and they will go out of their way to do so.

Vultures will also join other birds (or gliders) that are already climbing in a thermal, and often quite a large group will gather in this way. There is no "flock", however, in the sense of a continuing group. When the individual birds have gained enough height for their immediate needs, they leave the thermal separately in different directions, and the group disperses.

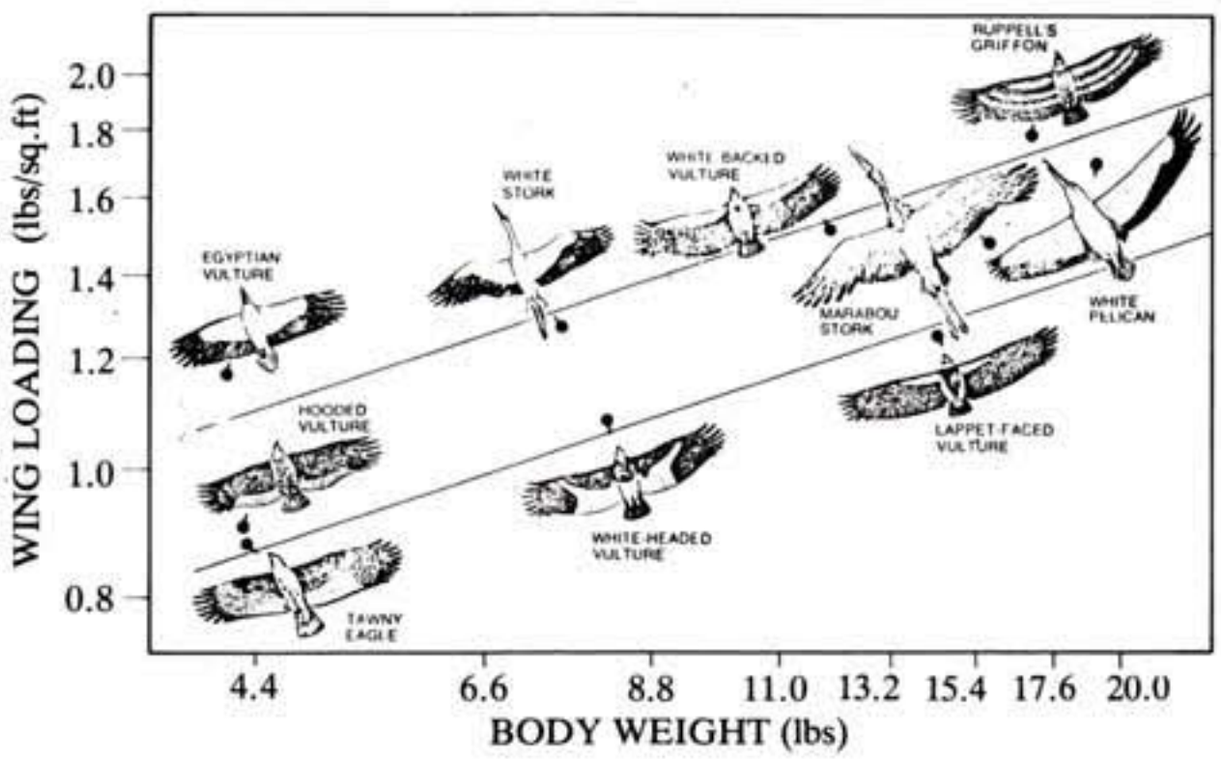
An entirely different kind of behavior is seen in the European white stork. This species is the longest-distance cross-country flyer of them all, and it relies almost entirely on thermal soaring to make its annual migration between northern Europe and the southern half of Africa. On the wing loading diagram it falls in the high-loading group. In some years many hundreds of these birds spend the northern winter in East Africa rather than pressing on farther south. There they can often be seen travelling about in search of the best feeding areas.

The white storks rely on co-ordinated social behaviour to increase their chance of finding thermals. It is rare to see one of these birds flying by itself; usually there are at least 20 of them together, and big flocks numbering several hundred individuals are common. When the storks are between thermals, they press on in the direction they want to go regardless of the appearance of the sky ahead. They will make detours to avoid rain showers but not to follow thermal streets or to fly under active-looking cumulus clouds. The members of the flock spread out laterally into a loose formation, and they fly steadily along on parallel headings. As soon as one part of the flock happens to fly into a thermal, the birds in that part start rising with respect to the rest. The others then alter their headings to converge on those birds that are rising fastest. Soon all the storks are concentrated in a spiralling column in the strongest part of the thermal, each of them constantly adjusting the position of its circle by reference to the relative rates of climb of its neighbours. At the top of the thermal all the birds leave together and once again spread out in their lift-searching formation. The net effect of this behaviour is to increase the probability of finding thermals by searching a path 200 or 300 metres wide.

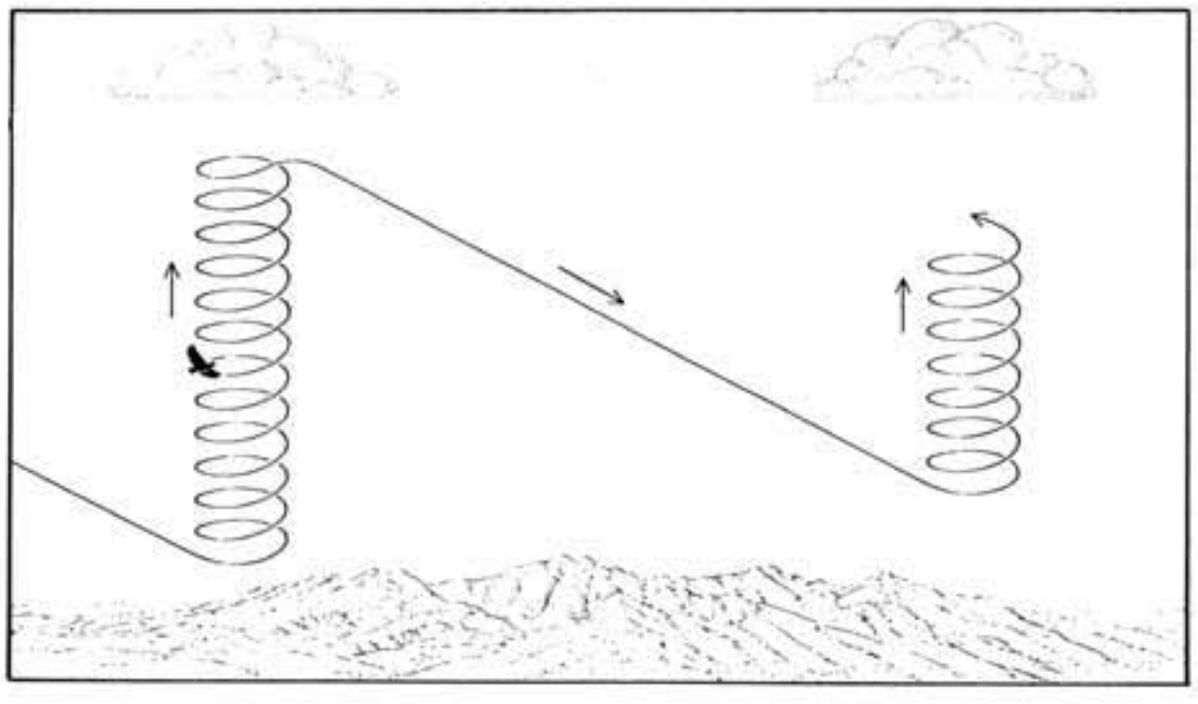
White storks tend to spend more time at the relatively high altitudes near cloudbase than vultures. The thinner air at high altitudes has much the same effect on performance as an increase of wing loading, and it increases cross-country speed provided that the thermals are large and strong. Glider pilots often continue their climb up into a cumulus cloud, but successful use of this tactic calls for a compass and at least one gyroscopic instrument. It is not quite clear whether storks can make an extended climb in cloud. They do enter cumulus clouds from the bottom, but on some occasions (and perhaps always) they stop circling just after they have entered the cloud and fly straight, skimming half in and half out of cloudbase, until they come out at the edge.

One of the most interesting species of East African soaring birds is the marabou stork. Marabous spend much of their time dabbling about in marshes and shallow water like other storks, but in addition they are partial to carrion, and they search for it like vultures. Their flight resembles that of white storks in some ways; for example, they sometimes travel in flocks. There is the curious difference, however, that although the marabous' formation on the straight glides is held just as steadily as the white storks', the marabou flock tends to spread out along the direction of travel rather than laterally. This behaviour suggests that the marabous depend less than white storks on flock behaviour for finding thermals. Supporting this notion is the fact that marabous often soar individually, like vultures, and will follow thermal streets.

The use of the flock as a thermal-searching unit is most highly developed in the white pelican. On the interthermal glides the members of the pelican flock, which again may number several hundred individuals, spread out in an extended echelon, or multiple-V formation, making a continuous line with no gaps. When the birds are circling, the entire flock turns in formation, so that from a distance one sees a periodic flash of white as they all catch the sun together. Pelican flocks travel in this way between the different lakes of the East African Rift Valley system.




**Ten Soaring birds** observed in East Africa fall mainly into two groups: five birds with relatively heavy wing loadings *(upper diagonal)* and four with a relatively light wing loadings *(lower diagonal)*. The wing loading of the 10th bird, the marabou stork, is intermediate on this double-logarithmic plot. The more lightly loaded birds, able to soar in thermals too small and weak for use by others, hunt intensively over relatively small territories. The heavily loaded birds instead often fly cross-country for food.



**Cross-country flight** is the behaviour imposed on itinerant vultures such as Ruppell's griffon by the movements of prey. It requires climbing in successive thermals and gliding in the desired direction. In nesting season 200 kilometre flights are common.

**C. J. PENNYCUICK**

# Best of the Club Magazines

**No one writes about flying cross-countries in quite the same way as the inimitable Johnny Carr, World Championship silver medallist, the man with the most recognizable laugh in hang gliding. Underneath Johnny's lovable exterior, there's a winner trying to get out . . . his tragedy is that he's so often been second. This time, though, snuggle up to a warm fire and forget about the 40 mph gale outside and follow Johnny through his winning Southern Club record flight on June 29th last year. The distance record, 19 miles, set by Dale Clothier on a Hiway Superscorpion, from the Dyke to Cuckmere Haven, was a good one, and took some beating. Johnny's eventual distance was 27 miles. Here's how . . .**

## Devils Dyke to Cooden Beach
## by Johnny Carr

The day looked pretty good from the start but I was certain a sea breeze would come in from the south west and switch the wind off to Mill Hill. It was about mid-day when I arrived at the Dyke, to the usual greeting ('You've missed it, son, you should have been here this morning'). Mind you, I'm used to that. I could see it was still well soarable and very warm. I thought the quicker I rig the better because its got to sea breeze in this heat. I rigged and took off. After about 10 minutes I picked up a blob that sent my vario 1,200 ft a minute up round three 360 turns. My ears hurt. I got spat out over the falls, and I remember thinking I definitely didn't want that one any way, it was going up too fast for me and I didn't like the sight of where it was leading to very much either. The sink between the Blobs was a bit rough also. I landed after this. Still amazed that there was no sea breeze, I took off again. Ten minutes later caught a nice thermal, 400 ft a minute up and started circling. I reached about 600 ft between the Dyke Hotel and the North Bowl, and decided to go for it. I reached 1,200 ft AT/O and it all seemed to disperse, 1 down, then 3 down. I hunted around for a couple of minutes and headed toward the crossroads. I figured if I didn't pick anything up on the way I would at least find a lift back to the Dyke easily. I soon noticed my vario start to read 2 down instead of 4 down, so I turned a little more into wind. I read 0: I held it into wind a few seconds, it still read 0, I did a 360. Half way round the vario read 1 up and I could feel more lift under one wing. I turned back into it and started climbing, 1.2.3.4 up till I reached 1,800 ft heading toward Hollingbury, wind a little off to the West. The thermal seemed to disperse again. I got in heavier sink until I was convinced I would not make the Race Hill and was prepared to land at Hollingbury. I was at 800 ft by now, with 2 good landing areas worked out when 0 on the vario again. I was now quite a long way from the Dyke, so I remember saying "please God turn this into something good". I turned into wind and the vario read 6 up. Right up to 3,450 AT/O, wow, this is a bit peachy, a little nippy on the old fingers though (no gloves on); on the way up the ground just zoomed away from me. I was looking up and there were no nasty clouds, just very small wisps, so I just kept pushing. At 3450ft. it dispersed again, I was further inland than I have usually been when doing XC, and I felt that I could possibly do a personal best. I was gradually coming down and knew I could reach Newhaven even if I picked nothing else up on the way.

Down to 2,500 ft and 0 again. I circled, 1 down, out the other side, oh God. I tried a right hand 360, 0 all round. I did a few of these. Some I gained a bit, some I lost a bit, but all in all I was still hanging on to some altitude. In past the Newhaven transmitter, and I'm now thinking *Seaford*, my personal best is just over there. I got down to 1,700 ft going across the river at Newhaven, suddenly, 3 up. Peachy, turned into wind and I'm now at 2,000 ft and looking across I can see I'm level with Cuckmere Haven. Peachy, Dale's record is only just past here. Suddenly, 4 up and back up to 3,000 ft, by now I'm a bit mind blown. To my left I can see the big Reservoir in front of Firle. Underneath me below my feet, is High & Over, the White Horse clearly visible in front, and below I can see cloud wisps coming up from the valley. Between High & Over and The Back of the Long Man of Wilmington, as the wisps came up at me, they were getting larger until it was all around me. I would describe it as flying in a Turkish bath, the steam was going up faster than the Sink rate of my glider, and what would happen was I to circle? With the vario at 0 and 1 up, the mist eventually went past me and left me in 1 or 2 down, but in this area of the flight I could see more wisps coming up further down wind, so I pulled on some speed and glided to the next wisp. I did this about 3 times and managed to gain back the little altitude I had lost when I reached the wisps.

The largest of these wisps wound me up a little because up till now I hadn't been in much cloud but this one was starting to merge into a really big one and I was going up at 400 ft/min towards it so I decided to head round it and avoid going too close to it (it just didn't look inviting). By now I was heading over the back of Eastbourne. I recognised the huge roundabout that's on the outskirts of Eastbourne on the Polegate Road. I was sinking and on a sled ride. I was looking for clouds and there was nothing in reach. I was in an area of blue sky. I then thought, now I *should* have gone for that big cloud, I bet it would have been perfectly alright. Anyway, I was heading towards Pevensey Bay now and I can see a couple of nice clouds in the distance. *We're going out to sea.* At first I thought the wind had gone more northerly, but at Eastbourne the coastline changes dramatically and a westerly wind there goes out to sea (what a choker). I am now down to 1,000 ft AT/Off height, about 1,700 ft ASL. The sun is backing down on the sands below, still plenty of height to possibly pick something up. I've been in sink for ages, I am due for an up. Suddenly, bam, 6 up, the control bar nearly came out of my hands. I turned, 6 up all the way round, one 360, two, three and so on, back up to 3,000 ASL. Literally, I am about half a mile out to sea and still climbing.

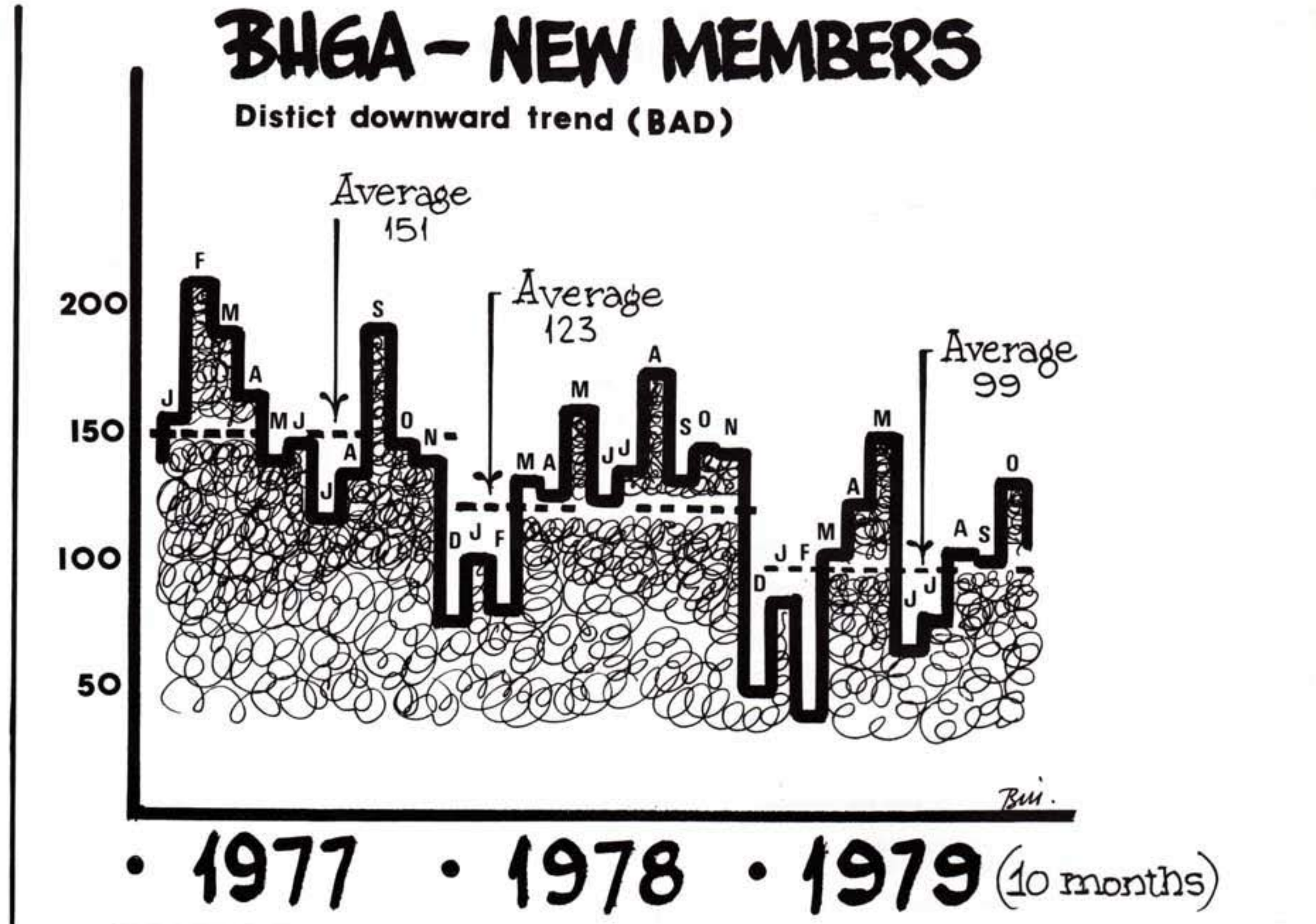
I keep trying to tempt the thermal to go along the coast by sneakily turning my 360 along the coast but as you will guess, splat, straight out the side. I am now looking along the coast, I can see for miles and I am thinking, if *only* these Blobs weren't going out to sea. I couldn't risk going out further although I was convinced I would have reached cloudbase, which was about 4,500 ASL. I decided to head inland at 40° or so and see what happened. I reached the shoreline with about 1,600 ft ASL, then it was just a sled ride. My only hope of another Blob was if I reached Bexhill, but I was sinking fast, down to about 600 ft and I can see my landing spot, a golf course not far down wind. No one playing golf, I flew over a few houses before landing, and there was a family in the garden. I shouted down to them to witness my landing, (they were freaked out by all this). They did. I rang the Dyke but they had gone out for the afternoon. So I rang Paula. She came up the Dyke to see if anyone would pick me up, as my car was there with plenty of petrol and she had to be back for the lad coming home from school. The only person who offered was Big H. Thanks H, but he couldn't come out after all. So I got on a train to Brighton from Cooden Beach Station (100 yds from where I landed). Met Paula at Brighton. By this time it is 6 o'clock and we drove out and picked up my glider. (The error doing a big one on a good flying day). People were still soaring till dark that day.

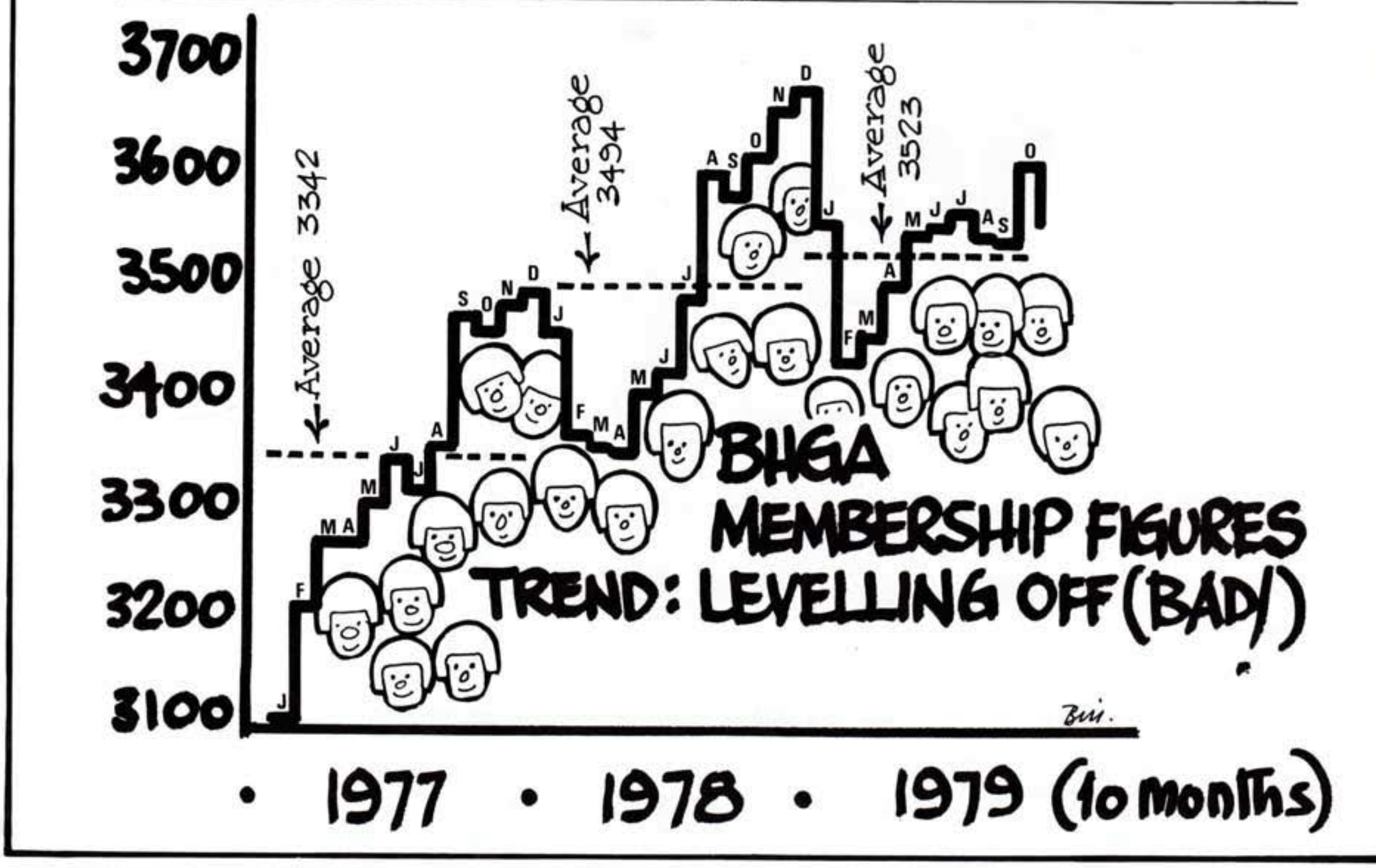
*reprinted from WINDSOCK, the magazine of the Southern Hang Gliding Club.*

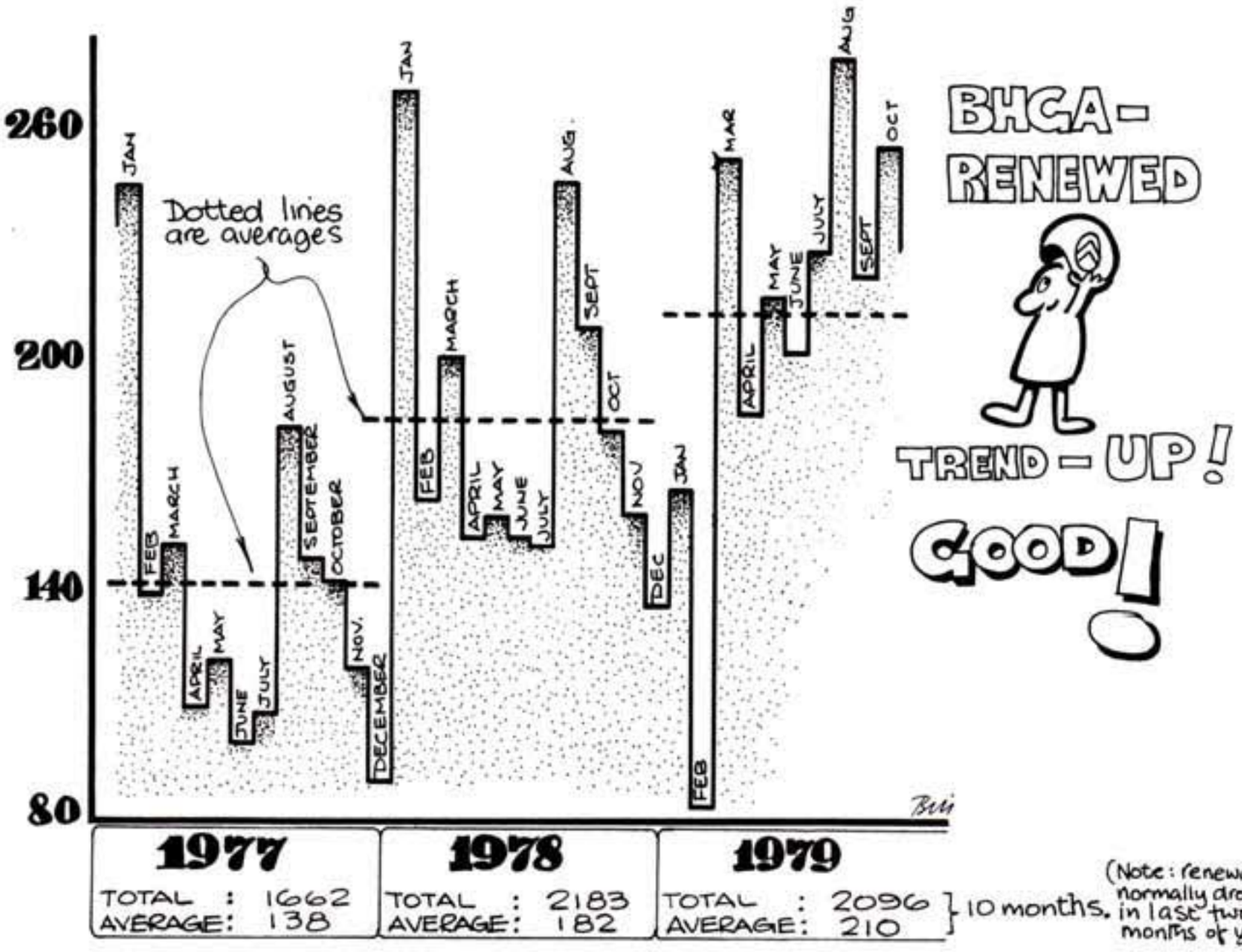
*photo: Bettina Gray*

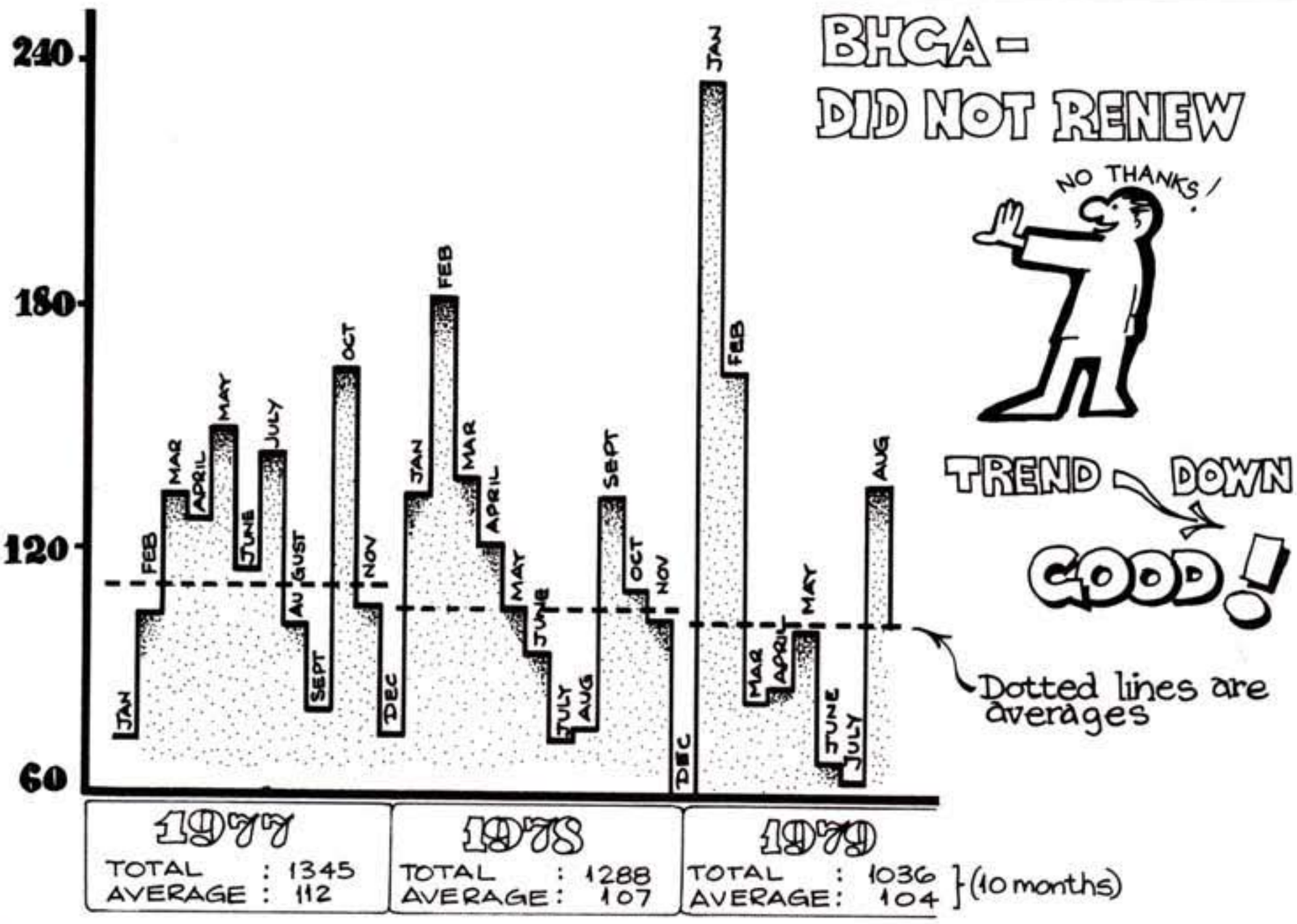
# BHGA - NEW MEMBERS

**Distict downward trend (BAD)**






# INFORMATION
# BHGA CENTRAL OFFICE
# GRAPHICS — BILL LEHAN

# Cross-Country in Wave

By Bob Calvert


On January 19th there was a high pressure over England, but a cold front was forecast to move in from the West during the day. The wind on Nont Sarah was only 14-18mph and very variable. I felt the conditions were wave induced.

I took off on my third flight soon after 12 o'clock. The lift seemed almost thermally and was improving by the minute, and soon I was above cloud. Looking downwind, the fluffy tops of cloud could be seen to the horizon, but only a few miles downwind and much higher than the cloud tops was an unmistakable lenticular cloud.

Once the lift stopped I turned downwind and the vario read 700' minute sink. I crossed the M62 expecting no more than a sledge ride (well, there was snow on the ground). But as I approached the lenticular the vario smoothly rose to zero, and I turned back into wind. It was a tremendous relief to be climbing again. During the climb I kicked the snow off my boots, folded my arms and prepared for a long flight.

The climb was a steady 300ft. min, and I therefore didn't need to venture far for better lift. I also got the impression that the wave system was drifting downwind slowly.

The gaps in the cloud below were becoming less frequent, and feeling a little concerned I looked downwind. To my delight a wave slot had formed (the down draught from the wave had caused a slot to develop in the cloud.) The tops of the clouds were also being smoothed over by the effect of the wave. Flying over the top of the clouds I crossed the slot with the vario hard against 1000ft. minute sink. The climb, once across the slot, was easy, and I soon jumped the next slot and climbed north of Todmoden.

I decided if any real height and distance were to be covered, speed was important, because the temperature was near zero degrees. I ventured along the wave as the slot was much longer but I was now worried as there were no more slots downwind. After 45 minutes a slot began to open up and I turned downwind, but as I approached it the slot started to close up.

The situation had changed suddenly. I was now pointing just to the left of the sun and keeping blue above and white below. I quickly decided to dive towards what little bit of ground that I could see. Descending below the tops of the clouds, the ground slowly disappeared and soon afterwards, the sun also went. Pulling speed, I watched my altimeter descend a thousand feet and then to my horror the vario started to read 300ft. min climb. It seemed an eternity going up and down in the cloud, and it was with a sigh of relief that I appeared in the murk and gloom of the Lancashire, Yorkshire or Cumbria countryside.

I started to 360 to determine the wind direction. Fortunately I was above a road, and flew downwind. I landed within 200 yards of a soarable ridge in almost exactly the spot I had landed last summer (exept I was travelling in the opposite direction). I was on the outskirts of Burnley.

If I had not been caught in cloud, then 10,000ft. ASL could have been really on, but I knew the importance of what I had achieved. I had flown in five successive wave and proved beyond doubt the feasibility of inter-wave flight on hang gliders. It was also my second XC of the year and it's still only January.

**Flight Details**

Glider — Birdman Cherokee
Vario — Colver
Compass — Sunto wrist type
Extra Clothing — two pairs of thermal underwear, balaclava, arctic mitts
Take-off — Noon, January 19, 1980
Landing 2.00pm
Distance 16½ miles
Maximum windspeed — 20mph at 2,000ft. ASL

**It was only that evening that I discovered that Alf Williamson had tragically been killed only seconds after I had been flying with him. I did not see the accident as I was above cloud. I don't know for sure but the accident may have been induced by wave rotor, or the approaching cold front, but it will serve as a constant reminder of how powerful the air is in which we fly.*

*photo © Bettina Gray*


*photo: Bettina Gray*

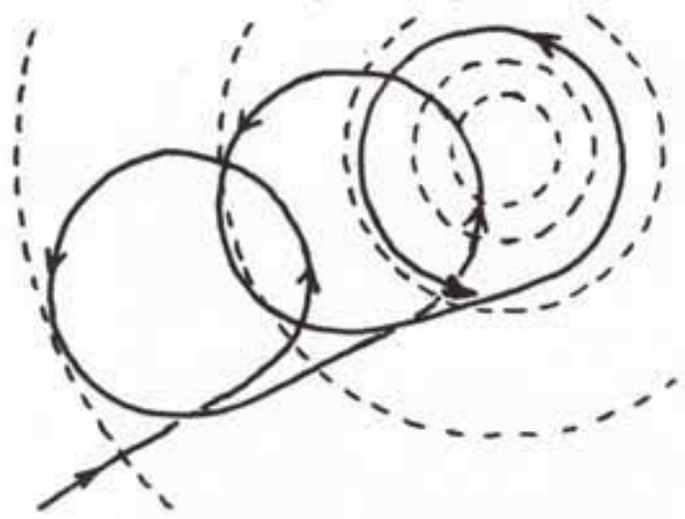
# LIGHT WIND THERMALLING

Launching in non-ridge soarable conditions into THERMALS can be surprisingly successful and very rewarding.

**The Thermal Cycle**

As the thermal (warm air) is rising surrounding air is sucked in. In light winds, the wind will blow *towards the thermal.* Now imagine being on the hill, ready to launch. The light headwind dies away, which means the thermal is just in front of the hill. You must launch *immediately* the air becomes calm and warm. The wind will quickly freshen, which means the thermal has passed by. General rule of thumb: LAUNCH IN THE LIGHTEST WIND.

**Continuous 360 Centering Technique**



In light wind thermals, a slight loss of height can mean you go down, so it's imperative not to fly in sink. As soon as lift is encountered — *360* — once you are certain you can get right around without flying through sink. It is likely you did not fly as far into the thermal as its centre, so on every subsequent 360 straighten slightly when the vario indicates strongest lift. This technique is automatically self-centering, and will always keep your 360s moving towards strongest lift. The technique will prevent you from flying in sink and possibly losing the thermal.

# THE SECOND THERMAL
## by 1979 British Champion, Bob Calvert

*Ancient Calvert photo — should give heart to all novices.*

The choice of which thermal to set off cross country with is not determined by how good the thermal is that you are already in, but how good the prospects are of there being another one downwind when the first one has decayed.

**Points to Watch for:**

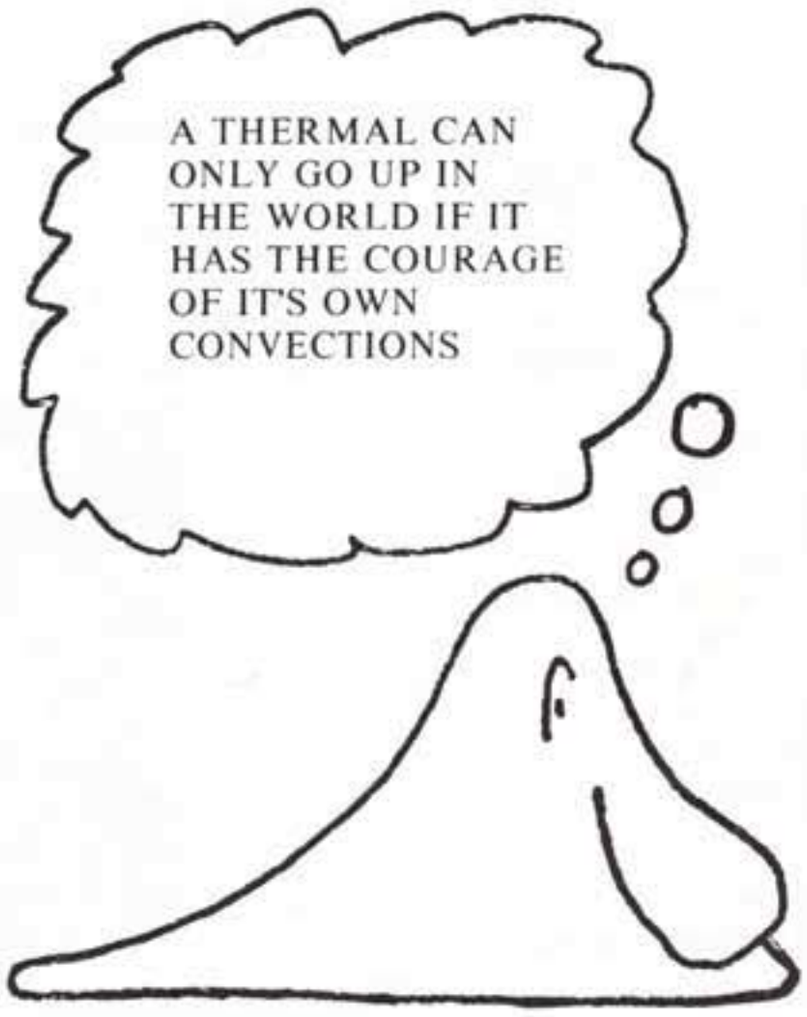
1. If the time between thermals passing through the ridge is long, say 45 minutes, or the cumulous clouds are well spaced, the chances of gliding to the next thermal are small.
2. The cloudbase will rise during the day and so the chances of reaching the next thermal increase. In setting off cross country late, there is obviously less available time to fly distance, so a balance between the two has to be reached.
3. Other successful (or unsuccessful) attempts by other hang gliders to reach cloudbase and the next thermal.

**Technique**

1. Patience is the name of the game. Stay with each thermal as long as possible and never leave early. I have never had reason to yet. (but see Robert Bailey's 50 mile XC article, *Wings* No. 6, 1979 — Ed.)

2. To determine if the thermal has decayed, or if you have flown out of lift, the rate of sink is usually a good indicator. If the sink is only gentle, then the thermal will most likely have decayed. If the sink is heavy then it's likely you have flown out of it into the surrounding downdraught. Look up to see where the cloud is and see if it has dispersed to confirm this.

3. Once at cloudbase more and more concentration can be used to watch the sky and ground downwind. If there is already a large cumulus downwind within easy reach try to resist the temptation of gliding to it, especially if the edges are no longer clearly defined. Ideally try to aim for a small developing cloud which will not only last the time it takes to fly to it, but will allow you plenty of time to reach its cloudbase to concentrate on finding the next thermal.



# NEWS


## FRENCH PROBLEMS

There's a strong possibility that the 1978 European Champion, Gerard Thevenot, who was third behind Joseph Guggenmoss and Johnny Carr in the 1979 World Championships, won't be able to defend his title in the European Championships in Kossen this June. He could fail to be selected because of a massive row that goes straight through the middle of French hang gliding.

In France, unlike here, there is only one manufacturer, La Mouette, owned by Gerard Thevenot. Before the present brilliant La Mouette machine, (the ATLAS), Gerard built and flew the JET. It was on a JET that he won his Kossen 1978 title, a machine with superb performance but some flying characteristics that caused doubt.

At one time, the governing committee of the French Federation — *their* BHGA — sent out a letter internationally, in effect *grounding* the JET. The Italian Association, which received the letter, got another one a week later. The second letter was from the French Federation's president, asking them to disregard the doubts about the JET. The following week the runner-up in the Italian Championships — the equivalent of our Robert Bailey — was killed flying a JET in a tucking accident typical of the doubts expressed about that machine.

In the aftermath of that death, the French federation president's letter came to light. Confronted with it — in France — he is said to have made a number of weak excuses and resigned. There was a general change within the Federation. One result was that relations between it and the major — ONLY — French manufacturer became strained.

At the World Championships in Grenoble last year, when the French won the TEAM CHAMPIONSHIPS, the Federation, which had paid the entry fees, asked the French team to wear Federation T-shirts while they stood on the podium. Most of the French pilots were on Mouette gliders, including Gerard, and they protested that the federation shirts were "too big, badly made and ugly". In the event, when they stood on the podium, Le Mouette pilots wore Mouette shirts.

The French Federation was furious about this, and has, in effect, banned the offending pilots, the equivalent of banning seven of the top ten British League pilots. The men running the Federation, who have good relations with the official French sporting bodies, and — like us — receive considerable funds from those bodies, have no intention of letting a manufacturer dictate to them in official competitions, particularly with French prestige so high after the superb organisation at Grenoble. Gerard Thevenot, on the other hand, is an ace flyer, leading a band of ace flyers who have gone around the world putting French hang gliding on the map, and he — apparently — has no intention of being dictated to in return.

In January, Gerard went to a Federation Council meeting, but was told to go away and prepare a report on the incident, for consideration in the future. He's hurt, angry and is apparently going to be in Brazil when the issue comes up at the Federation's AGM . . . in which case, by all the political norms, he'll be chopped to pieces.

Any top competition pilot in Britain knows this year we really want to beat the French. Any Frenchman worth his salt knows we are the ones he has to pound. But no one wants to win because the best in France is banned, however sympathetic one is with the Federation's case. Please find some way to save face with each other. Please don't burn all your boats, either of you. No Association can be dictated to by a manufacturer. No country can afford not to select its most outstanding pilot.

Just work it out in time for Kossen, please.

## NEW DUTCH RECORD
### by Paul Beukers

1977, 14th January: Readers of *Wings!* will probably remember the article about flying in Holland. At that time the record stood at 4½ hours and it was not until last summer that it was broken by Derk Thijs, many times windsurfing world-champion, and one of my school's pupils. Accompanied by Briforge pilot David Blinkhorn (and, during his last hour, by me) Derk flew for five hours on the 120ft high (low?) sand dunes in perfect flying conditions. He was the first in Holland to cross the five hour barrier.

As I am always looking for something special, I decided Monday morning, 14th January 1980, at nine o'clock that the record was going to be mine again. Weather conditions didn't look perfect (we need a south-westerly, 15 to 25 knots) as the forecast was south to south-west, 5 to 18 knots and the temperature well below freezing. Anyway, I knew it was going to be successful, so I took out my Cherokee, got my winter clothes and went to the dunes, discovering there that I had forgotten my moonboots and my silk cap.

"Then I'll go without them" I said to my wire assistant. I told him that after an hour I would decide whether to go on or to quit the attempt. After twenty minutes I could see that he was suffering from the cold and I told him that the flight was on. He went to inform the newspapers. During the fifteen minutes he needed for the photographer I thought "what the hell was I doing it for?" And I could not find a proper answer to this question. I had been flying those dunes for three years now and I knew every piece of sand on them; I had made many long lasting flights and I did not think of it as a special performance to be proud of. However, the newspapers were already informed and I could not bear the thought of giving up.

After an hour or so I began to feel the intense cold. Despite my cocoon-harness, my feet were beginning to get very cold indeed and I stood up and jumped with my feet on the control-bar, and thus they became a little less cold. Also my throat was getting cold and I began to sing a couple of songs as loud as I possibly could. I felt sorry for the few spectators, because I can't sing very well!

Slowly the minutes went by and I fought the cold by doing 360s about 50ft away from the dunes, missing the hillside by only a few feet. Very exciting and a good exercise. I was astounded by the small turning radius of the glider and almost went too far. It was only with great concentration I got back into the rather weak lift band. All day I had very turbulent weather and the lift was sometimes there and sometimes it was almost gone. I discovered by doing fast flying manoeuvres that I got too cold, so I had to be careful.

All in all, my flight became a 5½ hour lasting, gracefully-executed air ballet, except the moments during the fourth hour when I lost control for a second and when the glider was turned 180 degrees by a sudden gust. When she started flying into the hillside, I was not able to move my arms. Only at the very last moment did I succeed to get her back on course. After twenty minutes of flying very 'weary' (I was hardly aware of what was happening), I got slowly back to my senses and when I made the five hours I wanted to get down as soon as possible, but I flew another half hour and began to think about my landing. I was worried about my feet hurting because of their stiffness, so I hit them against each other during my landing approach, which resulted in a smooth, stand-up landing.

During my flight the only troubles I had were my feet and after four hours, my forehead. I wore silk inner gloves and ski-gloves (leather), a heavy nylon motorcycle jacket and skiing trousers. My harness didn't give me any trouble and I had a very relaxed flight in it. The glider proved itself ideal for this long concentrated and cold flight.

**Paul Beukers**

# An Unfair Advantage


# THE SOLAR STORM

Designed principally for cross-country, the Storm represents a true advance in performance. A performance the pilot can use because the handling is a delight, positive in pitch, very light and nimble in roll.

The absence of wing-wires contributes to the low drag and sweet handling, making the sky the challenge — not the glider.

An exceptionally high standard of quality is evident throughout the wing.

An uncomplicated and rugged air-frame realizes ease of assembly and confidence whilst airborne.

**The Solar Storm — the long term glider for the 1980's.**

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photograph: John Wadsworth
design: Mike Hibbit

# Flexible Battened Hang Gliders

# REGARDING LUFFING DIVES

By Peter Anstey

**We are led to believe, through advertising and from test reports we read, that the gliders in current production have the built-in capability to recover from luffing dives. In the old days we flew home-built jobs on which we accepted the risks (probably because we understood so little about them), but today times have changed and we pay for R & D and consequent peace of mind.**

**We hear of drop tests, where gliders are dropped vertically from cranes to test their ability to recover UNASSISTED before dropping too far, where the dummy pilot weight is suspended from the hang point, resting against the forward part of the keel. I personally suspect that all we should assume from these tests is that the gliders will recover, if dropped vertically from a crane, and NOTHING ELSE. It would, I feel, not be correct to transfer the recovery capability to the real life situation of a fully luffed dive.**

As a glider is let go from a crane, to drop vertically, it quickly picks up speed from the standing start. Before the glider reaches its gravitational speed, the tip rods and held up sail at the rear of the root become aerodynamically effective, and begin to arc the glider out of its vertical, or even tucked, position. However, a glider which is whipstalled and tumbles to a nose-down position with the pilot having lost the bar, is a different and REAL LIFE situation. Here, the pilot shoots through the control frame, hitting the forward keel and dragging the glider down nose first, at gravitational speed, with equal amounts of air on the top and bottom of the sail. The sail is immediately flapping like paper, probably preventing the held up sail at the rear from receiving clean air to operate effectively.

## LITTLE EFFECT WHEN LUFFED

In the drop tests, I believe the gliders are held in a negative position, past the vertical (effectively tucked). When dropped from this position, the air acts upon the top side of the sail. In this situation, it is easy to see that the held up tips and root will arc the glider out positively. When the glider is in a *luffing* dive however, the sail is completely ineffective, except for the drag that it produces. Now modern gliders with large keel pockets may have a held up sail at the rear of the root, but what is this 'safety feature' actually doing? I suspect that it will have little effect. When luffed, we are concerned with the sail, so imagine a glider with a high held up keel pocket dropping at an angle of about 70 degrees. The sail is now effectively fixed at two points along the root, i.e. the nose, and the rear where it is held up (not at the bottom of the keel pocket). Between these two points it will simply flap in that plane. (Fig.1).

If this is the case, then we must rely upon the tip rods. The most popular modern gliders have a nose angle of approximately 120 degrees. This means that the held up tip area is not so far behind the lateral axis of the glider (the point about which it would rotate on recovery), and therefore has to exert a strong pressure downwards in a luffing dive, in order to produce enough leverage to break the luff and arc the glider back to the positive position (Fig.2).

Furthermore, the leading edges, aft of the cross boom on gliders without negative deflexor cables may bend downwards slightly under pressure from the held up tips, but with insufficient force to pull the glider out. Indeed, this would reduce further the angle of the held up tips (Fig.3). In the early days, kingposts were fitted (as the last word in design improvement) to give effective transference of pitch inputs by the pilot throughout the keel of the glider, so it follows that a downwardly flexible L/E would not adequately transfer the force exerted by a held up tip. Some considerable force is required to pull the glider out of the luffed state. It is not simply a case of exerting a *slightly* greater force on the top of the sail at the rear than is being put on the bottom. Similarly, when the glider is diving at an angle of less than 90 degrees past the horizontal, there would, seemingly to be a tendency for the glider to recover naturally, but this is not so. Try luffing a sailing boat and see how long it takes for the sail to fill again as the helmsman bears away.

The luffed dive could conceivably occur through loss of control in aerobatic manoeuvres, or in extreme turbulence. We should not subject ourselves and our gliders to such situations, I know, but nevertheless I believe that the average pilot would expect his machine to recover quickly in such an event.

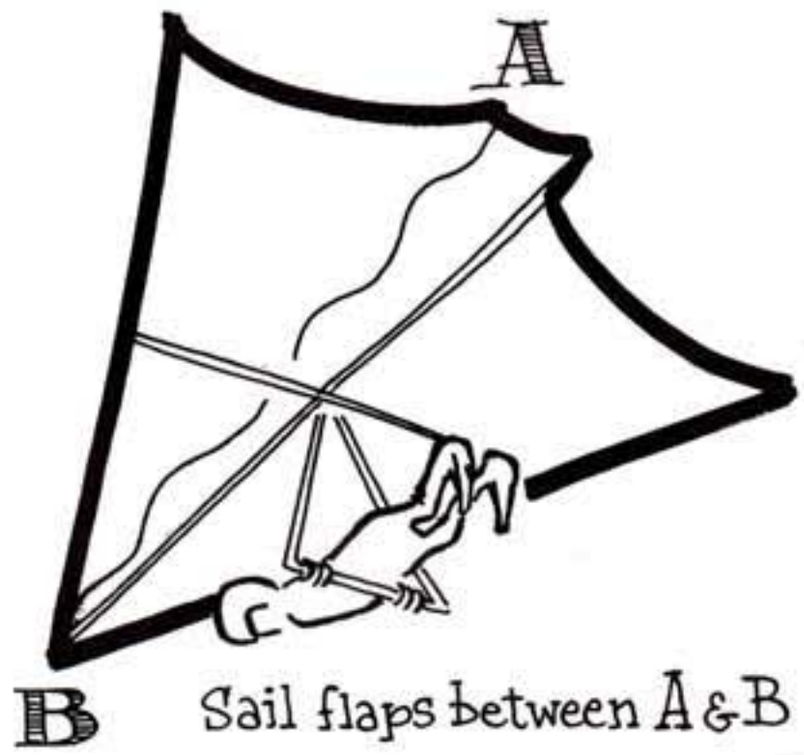



*Fig.1*

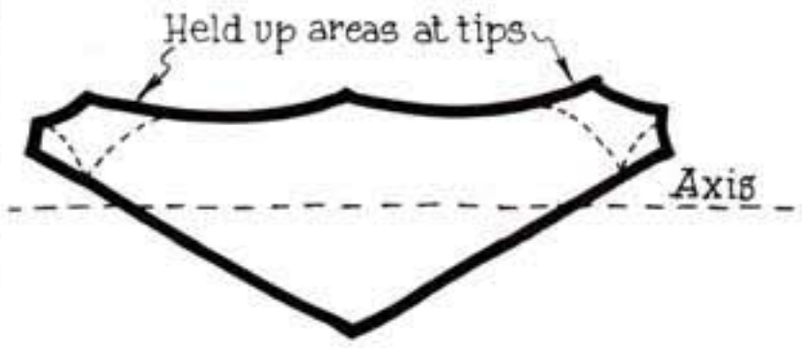



*Fig.2*

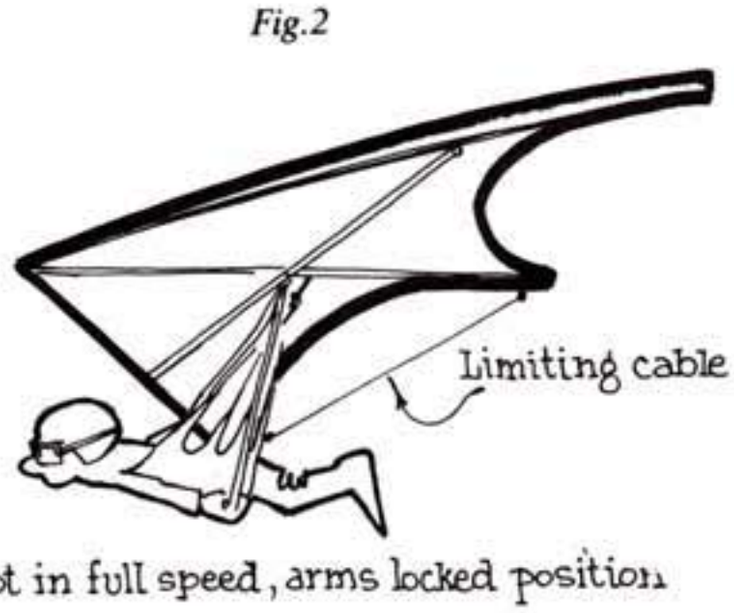



*Fig.3*

## SHOT THROUGH CONTROL FRAME

I recently watched with horror as a leading British glider with flexible battens, tip rods, and a held up sail at the rear of the root, came out of a past 90 degrees wingover. The G force created, snatched the bar out of the pilot's hands, causing him to hit the rear of the keel. The glider stalled, and he was shot through the control frame as the nose dropped, pulling the glider into a luffing dive. The glider descended at approximately 70 degrees past the horizontal for over 400 feet (luckily, outwards from the ridge edge). The glider itself MADE NO EFFORT TO RECOVER, and did not acelerate or deviate from its course. The pilot was eventually able to climb backwards along the front wires, through the control frame, and pushed out vigorously. The glider was seen to arc out nicely at the last moment, escaping impact at the bottom of the slope.

I am not so much concerned that the glider went into the dive (we can put that down to pilot error), but that it made no effort whatsoever to recover without the help of the pilot, who luckily did not get caught up in the front wires.

## FOUR POSSIBILITIES

A few suggestions may stimulate thought towards this aspect of glider safety.

(1) A good idea may be to fix a cable from the rear of the keel to the pilot's harness, which becomes taut in a full speed, arms locked position. This could be snapped on to the harness on each flight (rather like a seat belt in a car). This limiting cable would prevent the pilot from shooting through the control frame, and may prevent the dive in the first place, and it would certainly make it easier and quicker for the pilot to recover and get his weight fully behind the control frame to push out. (Fig. 4).

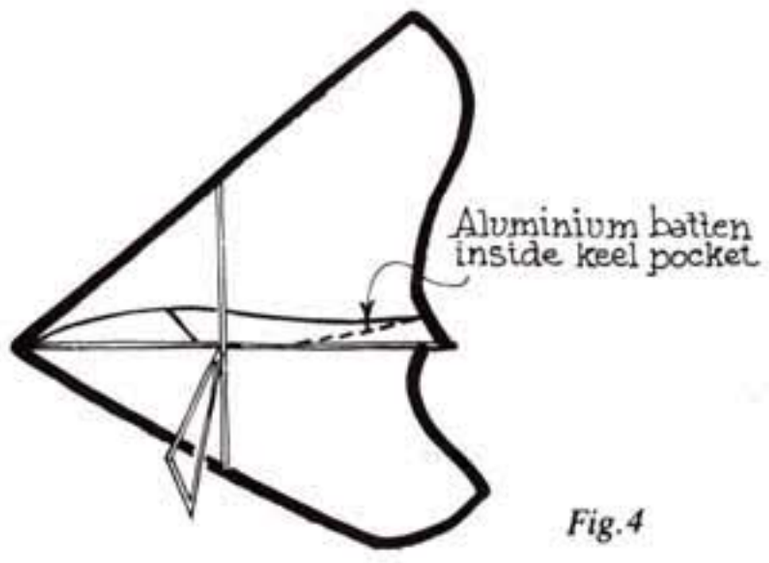



*Fig.4*

(2) At the root, it *may* help if an aluminium batten were fixed underneath the sail, inside the keel pocket, which may hold more shape into the rear of the root in a luff. Or what about a full length preformed batten with reflex, to be placed in a batten poket at the root?

(3) When flying, many gliders display slack fore and aft top rigging cables. When it is pointed out to the pilots that the keel pocket will not be held up effectively, if the rear cable is slack, they usually reply by saying that it will tighten up if the glider goes negative, when the held up sail is required. In that statement they are mistaking a tuck for a luffing dive. When luffed, the sail is not pulling positively nor negatively on the airframe, so the held up sail at the root will not be as high as the designers intended it to be (with reasonably taut cables), lessening its already slim chances of working effectively.

(4) Would it not be better, for safety's sake, to angle the tip rods up as near to the sail as is possible (still allowing their freedom of movement in turns and turbulence), instead of having large gaps as is evident on some gliders?

When flying high, the pilot stands a greater chance of shifting his weight backwards in time, but as most of the flying in this country is done in close proximity to terra firma, perhaps we ought to be more concerned with the problem than pilots abroad in countries where most of the flying is done at great heights.

I am, admittedly, not involved in glider manufacture, but I therefore have no axe to grind in respect of vested interests in any particular make of glider and would hope that manufacturers can come together and discuss this matter further, for the good of their customers — you and I — instead of simply condemning their competitors for their own eventual profit.

**Pete Anstey,**
**Bridghouse, West Yorks.**

## SOUTHERN DISASTER

SOUTHERN HANG GLIDING CLUB, once Europe's largest, faces a financial disaster in 1980. At the moment, renewals of memberships for the current year are well down on last year, and the Club is being forced to consider a major programme of economy measures which could involve the club in losing sites.

At the February meeting of SHGC's Committee, it was agreed that news of the club's financial problems should be communicated to the BHGA membership in an attempt to reduce the evasion of payment by members of other clubs who visit the South Downs.

Peter Day, SHGC's Treasurer said recently: "It makes me sick sometimes — I have recently joined the Thames Valley Club, and on several occasions I've heard people bragging that they've visited sites like Firle, and have got away without paying the site fee."

This sort of thing is to be heavily discouraged in future. All visitors to SHGC sites will be required to pay the £1.00 per week temporary membership fee — the Committee will have a major drive to ensure that everyone's membership is up to date.

SHGC's Chairman Tony Fuell points out that the SHGC fees, once the highest in the country have not gone up for four years, and the pound-a-week visitor's fee is very good value compared to the 50p-a-day demanded by many Clubs elsewhere. "If we don't get more members" he says "We will have to increase our fees by a very large amount next year."

As at January 31st, SHGC had 128 members, compared to 250 at the end of November last year. The deficit, says Tony, is likely to be over £2,000. He notes "We may well have to consider revising, not only the subscription rates, but the system for collecting them. Various schemes have been suggested, including a 'joining fee' for new members, and an end to the present system whereby Club memberships run from November 1 each year, with new members getting a rebate if they join inbetween. We have special problems in the South — agricultural land is very expensive, and it is necessary to pay the going rate for the sites. Anyone who avoids paying their dues is only helping to rip-off his fellow flyers, and hasten the closure of our sites."

*Graham Slater — photo: Bettina Gray*

Anyone who is in arrears with his SHGC subscription, or who wants to join as a new member should write to: **Peter J. Day, 112 Cotswold Way, Tilehurst, Reading.**

*The Club controls the Devil's Dyke, Mill Hill, Ditchling Beacon, Firle, Beachy Head, Newhaven and Storrington. Steyning Bowl is run as a private venture with SHGC aid, and separate arrangements exist for payment. Visitors to any of the other sites will be asked to take out Temporary Membership of SHGC before flying. The SHGC Sites Guide, now available gives full details of access, landing, and take-off areas for all the above sites. Price £1.00; it may be obtained by writing to Peter Day at the above address.*

### SHGC DINNER DANCE

A dinner and dance occasion has been arranged by the Southern Hang Gliding Club. It will take place on the evening Saturday April 12th at the Devils Dyke Hotel. Tickets, price £7.00 each will be available from: Johnny Carr, "High Banks", London Road, Burgess Hill, Sussex. Tel: Burgess Hill 42324. All profits if any will go to the Club to aid the dire cash-flow situation. **BHGA members everywhere are invited.**

## SOUTHDOWN SAILWINGS

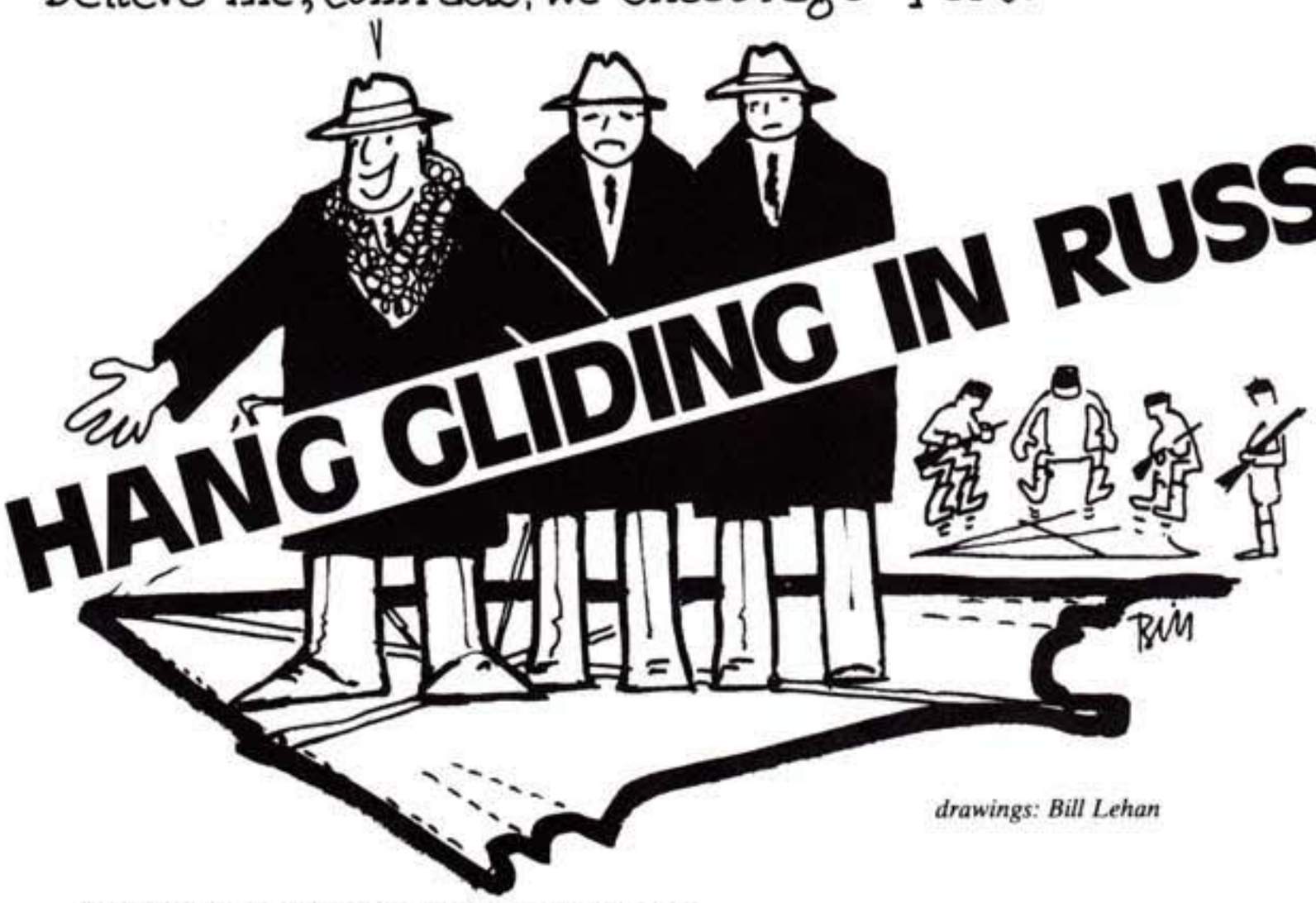
Ian Grayland's new company (in which it's understood that Bob Wiseley has an interest — their machines are known as GRIZZLIES) has moved its address. The Sigma will now be built at 82 Goldstone Villas, Hove, Sussex BN3 3RU, (Telephone Brighton 732007) because of what Ian says is an 'inevitable difference of opinion with the local council over the cottage industry principle and its application to contemporary surburban life'.

## GRAHAM SLATER

*Graham Slater, 26 years old, top pilot in 1978 and '79 American Cup — Winner 1979 Francis Rogallo Trophy.*

*Graham — seen here watching League opponent — has a small workshop at the bottom of the Devils Dyke in Brighton, Sussex.*

*His first hang glider is called a ZENITH, by ULTRASPORTS.*




drawings: Bill Lehan

# HANG GLIDING IN RUSSIA By Alfred Porter

*I commissioned this article before the Soviet Union went off empire-building in Afghanistan, and when it seemed like a good idea to find out what was being done in hang gliding by countless millions of people behind the Iron Curtain. Even if we're now not going to try and send a trade/competition team to Russia this year, the following article is the first time ever a comprehensive article on hang gliding in Russia has been published, and SCOOPS* Vol Libre, Glider Rider *and* Hang Gliding . . . *which is very pleasant. One day, we'll be able to use some of the enclosed information.*

**Brian Milton**

*Alfred Porter broadcasts on the Russian Service of the BBC. He came to Britain three years ago, after getting an exit visa from the USSR in 1972 — about the time Len Gabriels started to fly hang gliders — and went to Israel. He became interested in Rogallos while he was still in Russia, with some desperate idea — in 1971 — of building a flex-wing which would float him to the west. He even started experiments with big Rogallo models, flex-wing, three-wheel chassis, and the engine of a speedway motorcycle. What he describes as his 'suicide mission' didn't, in the end, need to be attempted, because he was given legal permission to go west.*

*He went to Israel and kept his interest in Rogallos. He says he built the first Israeli hang glider, and later tried to establish a small hang gliding company — called AGUR — which means THE CRANE in Hebrew. The venture failed, for him, when his best friend and partner let him down, and he came to London and the BBC's Russian Service (which, at the moment, is working skads of overtime).*

*All his free time he spends tinkering with hang gliders. True to the Russian tradition, he builds, not buys. As it is the first time in his life where not only is flying permitted, but all the spare parts and materials are freely available, he's already built a new glider. He's now finished what he calls a 'pre-production' model of EGLEE — a high-cambered floater, aimed at lazy flying in light winds. This is the kind of flying ALFRED PORTER thinks he deserves, after all.*

The story of Soviet Hang Gliding is a story of few enthusiasts, deprived of any useful information, materials, funds, means of exchanging their experience and knowledge, deprived even of legal right to build and fly an aircraft. I remember a few stories told by amateurs of aircraft-building on how KGB people came to aircraft-builders to confiscate and to destroy aircraft which had already successfully flown.

All useful practical knowledge on how to build something that will fly is carefully removed to "Spetzkhrans" — special funds with very restricted access. All air sports take place only within the framework of DOSAAF — the Voluntary Society which helps the Army, Air Force and Navy. Under its heavy hand nothing can survive, except things of direct usefulness for preparing cadres for Air Force and air commandos.

Given all that, it was almost incredible when an article on how to build a Rogallo tow-kite suddenly appeared in "Modelist-Konstruktor" ("Modeller-Designer") magazine in the spring of 1968. This kite was built and flown by Mr. A. Kazennov, who flew hanging with his hands from the A-frame without any suspension. There was no A-frame though, since the uprights fitted to the middles of the crossboom. The article was a very practical one, full of drawings and specifications. The author was very persistent in saying that this craft could fly only under tow. This emphasis, together with the vast difference between a Rogallo and normal aircraft, were probably the reasons for the approval of this article by the censor.

After that, here and there you could sometimes see in the Soviet media photographs of skiers flying Rogallos in the Alps, or in Australia. No doubt, some Russians started to build and fly Rogallos of Kazennov's design, but just enlarged in dimensions (one described in "Modelist-Konstruktor" had 12ft. long main booms and 80 degree nose angle). But for the Soviet press it took 7 years to recognise this. At the end of 1974 "Modelist-Konstruktor" published drawings of free-flight Rogallo that were almost copies of Kazennov's kite. It had, though, a primitive swing-seat. One accompanying magazine article mentioned Muscovite Dr. M. Gokhberg, who flew in the winter of 1973/74 with skis in the Caucasus mountains. The magazine admitted that many flight-fanatics were building kites, and that hang gliding, especially tow-kiting, became very popular.


Then there was a three year silence in reporting on development of "Delta-planerism" (Hang Gliding) in the Soviet Union. Perhaps the authorities once again decided to rethink their attitude to this sport, even though the media had to admit that "each year this new-born sport finds more and more new supporters".

In 1977 this silence suddenly came to an end. Did KGB calculate that a rogallo is an easy target in the sky? And perhaps to fly it under power could kill a pilot better than machine-gun fire? The Soviet Union has a huge aircraft industry, and many aviation institutions where students quite often build (always collectively) small airplanes, gliders, sometimes even helicopters. It is absolutely certain that many hundreds of enthusiasts found some suitable (so they thought) materials and built simple craft such as rogallos. But there was a very real danger that many risked killing themselves when trying to fly, because of excessive enthusiasm coupled with the total absence of reliable information on building and flying a hang glider.

Suddenly "Modelist-Konstruktor" started to publish a chain of articles on hang gliding, under the revealing name "Deltaplan without secrets" ("Deltaplan = Russian word for hang glider). At the beginning of the series they put an interview with well-known aircraft designer, Oleg Antonov, who in his younger days, long ago, had started with building elementary gliders — as had most of his generation. Praising hang gliding for its breath-taking achievements, Antonov stressed the urgent need to bring some order into the sport to ensure its safety. This in the Soviet press is an admission that many necks have already been broken. Oleg Antonov called for hang-gliding to be put under the supervision of DOSAAF. He also stressed the great need for organising the material and scientific base for the sport.

It's a very tricky business to get aluminium tubes and suitable sailcloth in the Soviet Union! If you are just a private person the only way to get it is something very, very close to breaking the law. "Modelist-Konstruktor" wrote: "Some deficit of vital materials does not stop enthusiasts of hang gliding". Translating Soviet jargon, that means that people could not get proper materials, and build their craft from any scrap — with all the awful consequences.


The availability of this sport in the West made a great impression on Dr. M. Gokhberg, who somehow had the opportunity to visit Australia. Speaking afterwards at a conference of Moscow hang glider pilots, he excitedly spoke about *100,000 flyers in Australia*, including children and elderly people. He spoke about their methods of flying, teaching and training. He was obviously heavily impressed by the great range of different models and the quality of their design and parts, and by such things as purpose built flying instruments and two-way radios. **He was so impressed that he said that TRADING BODIES OF AUSTRALIA (VERY SOVIET!) BOUGHT IN 1976 1.5 MILLION HANG GLIDERS FROM BRITAIN ALONE. I am sure his listeners believed even in this unthinkable figure.***


Australia bought 1·5 million hang gliders from Britain ...

Since then, hang gliding in the Soviet Union has grown quite remarkably. In 1977 a national seminar of hang gliders took place in the Crimea — the traditional site for gliding events for 40 years. The Crimean mountains — old, softly-shaped, surrounded by warm waters — should be a really nice place for flying. One of the events of this meeting was the appearance of the hang glider "Sokol" ("Falcon"), designed, built and flown by Mr. V. Mikhailov of Leningrad.

The next year there was a big competition in Dombai Valley — a well-known ski and tourist resort in the Caucasus. It was attended by some of the best Soviet flyers from different parts of the USSR, 35-40 pilots, though I'm not sure of the exact number of participants. The best impression was made by V. Mikhailov's new hang glider "Sokol-2". He flew from 800m. (2,500ft.) high, a place called "Yusa", to the bottom, and everybody could see the exceptionally good and clean shape of his sail. After the competition there was a technical conference for the participants and Mr. Mikhailov made a very detailed report on his aircraft, and on how to cut and sew a good sail.

Here we come to the strong point in Soviet hang gliding, and I can recall an article in *Wings!* (September 1978), on some East-European Championship in Hungary, which was attended by a few British pilots. Dave Worth said in his article how strange it was to see everybody flying a homebuilt craft, made by the flyer himself. The gliders were often made of very unsuitable materials and components. But Dave didn't fail to mention the generally high level of design and flying skill of the participants, AND their exceptional readiness to explain anything about their glider. Of course, it stems from the plain fact that in Soviet conditions, there is no way to build hang gliders for a living. It isn't a *trade* in the USSR, and so the same magazine "Modelist-Konstruktor" publishes full drawings of the best Soviet deltaplans one after another, with specifications and explanations how to build them. (I consider those publications a very useful thing that you will never see in highly specialised Hang Gliding magazines in the West).

Probably the greatest and most spectacular achievement in Soviet hang gliding was a group flight by five sportsmen from Elbrus, the highest Caucasus mountain. In August, 1978 this group, lead by sportmaster Viktor Ovsiannikov, climbed with their gliders to the height of 5.200m. (16,900ft). It took them three days. From this summit, covered by deep snow, they could see far below many other mountains and the Baksan valley. They took off safely and landed in the valley below. The flight lasted half an hour. All five flew gliders of V. Mikhailov's "Sokol-2" type.

It is characteristic of the Soviet press that this news reached readers of "Modelist-Konstruktor" only in November, nearly a year then went by before a detailed story was published in another magazine, "Tekhnika-Molodezhi" ("Technology for youngsters").

More information on the situation in Soviet hang gliding today is provided by an article on the newest Russian deltaplan in "Modelist-Konstruktor" No.5-1979, and an article, a copy of which I got from Brian Milton and which was published a short while ago in a Soviet magazine (which one I could not identify for sure). A hang glider called an "Albatross", built by a Moscow engineer, A. Riabtsev, in the beginning of 1978, has fully battened sail with moderately high camber, free floating at almost all length of keel. Each batten has a rigid forward section made of aluminium pipe, and a flexible tail, made of plastic profile. The nose of "Albatross" is 110 degrees. With a full set of out-riggers, this craft is claimed to be very manoeuvrable and light in response. It's aspect ratio is 5.7, and best L/D is claimed to be about 8 to 1.

The article from the unknown magazine traces — in very grey and official language — the development of hang gliding in the Kuibishev province of USSR (Kuibishev is a big industrial city on the Volga river, 1,000km. east of Moscow). It has a vast complex of aircraft and missile plants, and an Aviation Institution, preparing engineers for University degrees. Kuibishev has one of the biggest local federations of deltaplanerists in the USSR, uniting 27 groups of enthusiasts in different factories, institutes and towns. The federation has a flight-methodical committee, and technical and organisational bodies. The groups often meet to talk about hang gliding. There exists — according to the author of this article, M. Mikhailov — a reference library on Deltaplans. A group of students of the Aviation Institute have built a simple and cheap flight simulator to give beginners their first lessons. In 1979, the federation held its first seminar for experienced pilots, aiming to make them flight instructors. Now, writes M. Mikhailov, they are thinking of how to equip their hang gliders with a small radio — to do so, they want to ask local radio fans for help (no wonder, in a country where even the thought of radio transmitters in open sale is a kind of madness . . .)

**What's Hiway been up to? Ed.*

**Alfred Porter**

# FLIGHT REPORT — 21 MILES FROM THE LONG MYND

There we were, about five or six of us, on the Long Mynd on an August day in 1979. A moderate westerly was blowing, and fluffy cumulus was forming all round. I had been flying for most of the afternoon in some very rough lift and getting up to about 1,500ft. a.t.o. On my last flight of the day (and most memorable ever), I took off at 3.45 p.m. and worked several thermals before hooking on to a nice smooth one over the wooded area of the hill, getting up to 1,780ft. a.t.o. at about 4.05 p.m. and joining a sailplane over the back of the hill. He flew forward out of the lift and I was left in no-man's-land with the lift rapidly deteriorating. However, I could see some beautiful cloud streets forming behind the Mynd so I flew downwind for about half a mile and then worked some weak lift before setting off again to the next good looking cloud.

I was very pleasantly surprised to see that I was covering a lot of ground on my straight glides and also losing very little height. In fact, only twice on the flight did I drop below 1,000ft. a.t.o. The first time was when I circled in a thermal about 500ft. over Brown Clee Hill, which is about 15 miles from the Mynd. I lost half a mile behind the hill, and sinking fast, I found myself getting thrown around with only about 300ft. between myself and a rough landing. I hung in there and, sure enough, I got it — 1,2,3 then 4 up which took me 2,000ft. above my lowly position in the Lee of Brown Clee. I was thinking to myself 'this is really my lucky day but how long can this lift go on?' By now I had come to a big gap in the cloud street and was in a steady 4 to 6 down. I was nearing the B4363 south of Bridgnorth and with very little height left I chose a flat cut corn field, turned into wind and landed at 4.45 p.m., adjacent to a bungalow where a very helpful lady let me use her telephone. I managed to hitch a lift to Bridgnorth and was met there by Angie Bullock who very kindly took me back to the hill where I was greeted by some very envious looks.

In the course of the flight I got five or six different thermals thanks to the cloud street, which I had never experienced before on a single cross-country flight. However, I think the most amazing thing about the flight was that I flew twenty one miles and my biggest height gain was only 1,780ft. I am convinced that, given the right conditions, it is possible to go much further — perhaps even to Northampton which just happens to be on the magical 100 mile mark from the Long Mynd.

Equipment used: Hiway Super Scorpion 'C', Ball Variometer, Thommen Altimeter.

**Graeme Baird**

# LETTERS

## TORA! TORA! TORA!

Dear Editor,

This is the first time I have written to *Wings!* although on several occasions I've been tempted to. Previously somebody has always managed to express my exact sentiments. And, in fact, John Storry's letter falls in this category.

I am writing to say to John: "You are not alone in feeling the way you are'. The BHGA must go on the offensive. The case of Frank Tarjanyi seems to have started things off — let others continue.

My club, The D & S Condors, found a site, one of the few locally that is inland and high, only to have a landowner ban hang gliding for absolutely no other reason than that he is able to. We were stupid; we asked him. Nobody asked if they could walk across his land, ride across it or pick the wild berries there, but because we drew his attention to our presence we were banned. My feeling is that we should fly the site and damn the consequences — if there are any!

The parallels to the current situation can be seen in the sport of diving, where despite an expensive bureaucracy the BS-AC seems to be unnecessarily involved in a continuous struggle of self-justification to people such as pot-fishermen, whom they should be attacking. Pot-holing, or caving, is another sport I'm involved in. It's safer, John, "they" can't see you underground although even here bureaucracy has crept in. The threat of third party claims — only one in the history of the sport as far as I'm aware — has resulted in remarkably high premiums for caving clubs, and the locking of caves for, often, no other reason than that the land owner is concerned that he *might* be sued in the event of an accident.

What can we do about it? One thing we must continue to do is alter attitudes to our sport to the point where it is taken forgranted by the public. My personal contribution is to explain to anybody I meet that hang gliding is no more dangerous than skiing, that it is non-polluting, quiet and harmless to onlookers. Not one of all the numerous members of the public I have met has had a hard word to say on the subject. I may say that I always make it my business to answer fully and completely any passer-by who takes an interest in my sport; even if it it means a little less time in the air.

Actions such as Ken Prydderch's (*Wings!* Nov '79) help the sport immesurably as do events like the recent Thames Valley fly-in. Pilots who have no time for casual watchers and aren't prepared to sacrifice a few minutes in the air are doing the sport a disservice. The mass media must be continually encouraged to regard hang gliding in a different light. Brian Milton's well publicised crash can't have helped, and the irresponsibility of the BBC in showing the Mike Harker film again, amazes me. Chris Corston told me the BHGA were trying to prevent it being shown two years ago.

I shall back my words with a donation to the fighting fund.

**Peter Glanvill**
**Chard, Somerset**

## GUATEMALA

Since 1966 up to 20,000 people have been abducted tortured and murdered by semi-official death squads in Guatemala. These operations have been openly condoned by the Government of President Romeo. With a total population of just over five million it is considerably more dangerous to be a Guatemalan than to fly an hang glider! General Romeo is a nasty little man, who is using hang gliding for his own ends; does the BHGA really want to be used? This is not a question of sport and politics, it is sport and mass murder. We are always saying that hang gliding is all about freedom — is it?

**Joseph Cullen**
**GLASGOW**

*P.S. Anyone for breakfast with Idi Amin?*

## BLOWING IN THE WIND

†Mike Collis' piece on windshear, with the diagram on the Boeing 727 accident, reminds me of a problem I've puzzled over for some time.

Someone somewhere in meteorology or aerodynamics must have the answer.

Shears and turbulence mean different things to different aircraft. Wave is sought by conventional gliders and avoided by airliners. Wave rotor is feared by conventionals but less so, I believe, by hang gliders. Conventionals try to soar gusts, hang gliders do so regularly. Airspeed and span must have a lot to do with it and hang gliders, being the slowest and smallest, should therefore be the best-equipped to handle turbulence, assuming good design.

Given that Cu-nim can generate 60 knots of lift or sink, the shear possibilities are immense and terrifying, but there must ba alimit on the closeness of such opposing airstreams, i.e. the shear, which will depend, I would think, on the viscosity of air.

The diagram, though it's porably not intended to be interpreted this way, would indicate 5 fps across 1000 ft, or a tenth of a knot across a hang glider, which isn't bad in roll terms, though the sink is certainly heavy.

Does anyone know the maximum theoretical shear across a 35ft span in free air?

**Ian Trotter.**
**EDINBURGH**

†*Mike Collis disclaims any responsibility for the piece.*

## SOME OF THE PEOPLE, SOME OF THE TIME . . .

Just to say that I've not written to *Wings!* before but your first issue under new editorship was the first *Wings!* for a long time that *didn't* leave me feeling really depressed and despondent about hang gliding, so I feel you deserve some positive feedback.

The first welcome omission was the lack of endless morbid accident reports. Now and again, an accident report can be an important and salutary warning but we've had far too much space devoted to them. Secondly, the letters were short and did not contain half-baked partisan critcism of other "in-group" members.

**Edmund Potter**
**CAMBRIDGE**

## BUT NOT ALL OF THE PEOPLE . . .

I hope the January issue of *Wings!* is not a forerunner of what is to come. Although everyone in the BHGA is interested in the success of the league and top pilots I do not think that the pages of *Wings!* should be dominated by the elitist few!

I object to the emphasis placed on minute details of these league tasks and placings, *quote:* "pilots from placings 1-8 would face pilots 9-18, 19-27; 28-36; 37-43." which really are of no interest except to the organizers of league competitions.

Hang gliding is a complex technical sport so I cannot understand why the Editor thinks that BHGA members are not capable of comprehending complex technical articles (January Editorial). One good point, however, is the use of club magazines as a source of articles, since at least this brings the focus back into Britain instead of in the Americas.

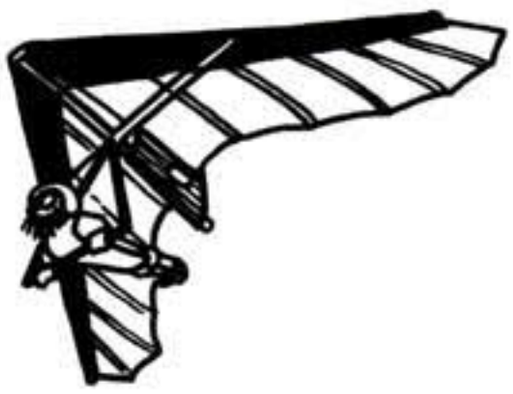
**Debbie Osborne**
**HARTLEY WINTNEY**
**Hants**

## WHERE ARE YOU, SUPINE FLYERS?

Preparing myself for a trip to Israel this Autumn, where I anticipated some long and relaxing flights in light breezes, I rigged my glider for the supine position and started my search for supine harness. When I couldn't find any trade adverts in last years *Wings!*, I tried five or six hang gliding schools — with the same lack of success. The people in Wales, who some time ago advertised supine harness, told me the chap who used to make them recently gave up hang gliding and nobody was now producing them. I found only two appropriate small ads in the last twelve issues of *Wings!* and neither was any help. Almost desperate, I managed somehow to find one old Dickson after an unbelievable chain of telephone calls to fifteen to twenty different people.

I would ask all of you who are really interested in flying supine and who would like supine harness to write to me or telephone (01-852-0763). If I get some fifteen to twenty responses, I would undertake to slightly alter the harness I have and make copies for those who would like one.

**Alfred Porter,**
**32 Leyland Road,**
**LONDON SE12**




IAN TROTTER THERMALING OVER EDINBURGH.


MILTON WAS AT A LOSS FOR WORDS!?? WHATEVER NEXT....?

# Clouds To Cause Concern

## by Ivor John - part 2

*Cumulonimbus clouds are by far the most dangerous clouds which might catch the unsuspecting hang-glider. They are an extreme development of the cumulus type and they possess vicious upcurrents and downdraughts, together with evil turbulence. Get too near a Cumulonimbus (Cb) cloud and you could be in very serious trouble!*

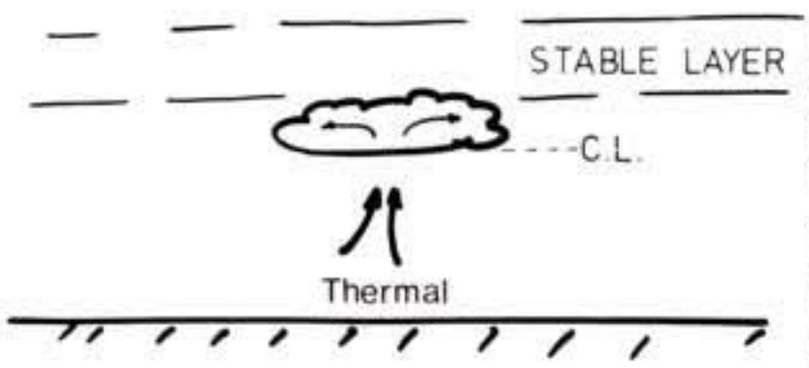



*Fig. 6 Stable layers prevent clouds from growing upwards.*

The smaller cumulus clouds which we use to locate thermals in summer do not grow to any great vertical extent. Their upward motion is limited by a *stable layer* which caps the lower convection layer, Fig.6. The thermal rises in the first place because it contains air which is warmer than that around it. But a stable layer is one which is relatively warm compared with the air below it. So when the thermal reaches the stable layer it ceases to be warmer than the outside air, and so it loses its buoyancy and stops rising. If cloud has formed over the thermal it spreads out or evaporates at this level. These stable layers occur most frequently near high pressure areas, and if the stable layer is below the condensation level no cloud will form at all.

Cumulonimbus clouds grow in an *unstable* atmosphere where there is no stable layer to stop the upward progress of the thermal. An unstable atmosphere means that the temperature of the rising air is always greater than that of the air around it. Because of this it always has buoyancy and continues to ascend. This leads to the build up of a huge upcurrent and the Cb is born! The Cb can reach towering heights and it can develop heavy showers of rain or hail, and even thunderstorms. Extreme turbulence results from the intense vertical motions.

Let's take a look at the build-up of such a cloud, and examine the up- and down- draughts more closely. First of all a thermal forms an ordinary cumulus, Fig.7 (a) and in an unstable atmosphere the cloud grows upwards rapidly (b). The water vapour in the air is turned into liquid droplets at the cloud-base and this releases heat (latent heat to you physicists). This heat continues to 'stoke' the thermal so there is always extra buoyancy beneath the cloud. In an unstable atmosphere, the upcurrent keeps rising and more air is sucked in from below, eventually forming a very powerful updraught.

Quite often the winds get stronger higher up, so as the cloud extends upwards the top tilts forward ahead of the base (c). Clouds leaning over in this way are easy to identify and are an obvious sign of stronger winds above.

It is well known that temperature decreases with height, so as the cloud grows upwards to great heights its top will become colder and colder until its temperature gets well below zero. This means that the water droplets turn to ice crystals, and this is when the cumulus becomes a cumulonimbus—when its top becomes glaciated. The cloud loses its bulbous, cauliflower appearance and becomes more 'fibrous', (d).

The ice crystals in the top of the cloud keep growing as more droplets freeze on to them, and eventually they become so heavy that the updraught is too weak to hold them up. At this stage they start to fall back through the cloud, and as the crystals drag down the air around them the downdraught begins. More and more ice crystals fall and the downdraught gets bigger, and as they fall back into the warmer air below they melt to give a shower! But as they melt they extract heat from the air so the downdraught is *cooled*. This aids the sinking motion and it too becomes a powerful blast (e).

This shows us how updraughts and downdraughts can exist side by side in a Cb, and the wind shear between them causes severe turbulence. The updraught may persist but often the downdraught takes over and becomes the dominant feature. It continues down until it meets the ground where it spills out and spreads — mainly ahead of the cloud (f). The front end of this nose of cold air brings a sudden rush of chilly air at the ground and is known as the GUST FRONT or SQUALL LINE. Its arrival brings very gusty conditions with winds increasing to perhaps 50-60kt for a time!! That's no place to be in a hang-glider!

The surge of cold air is sometimes sufficient to force the warmer air ahead of it to rise, and as the cloud moves forward there is this continual scoop of rising air ahead of it which has been used by experienced glider pilots to fly cross-country. In "Micrometeorology for Pilots", Dennis Pagen hints that hang-gliders might also be able to use it (p.63), but you won't catch me anywhere near it on purpose! With the threat of 60kt winds around and all the turbulence that goes with them, I'll be keeping well clear in my hang-glider! Another thing is that this rising air may be capable of starting off yet another Cb, well ahead of the old one!

So when are cumulonimbus clouds going to affect us? Without too much detail here are three likely situations:

(1) In summer, when high pressure is stationary over Scandinavia and a weak low is a feature over southern and central Europe. As the high weakens, thundery weather spreads into England from the SE, typically at the end of a long hot spell in Britain. Before the thunder occurs, it feels hot and 'clammy' or 'close' with light and variable winds. The Cbs then build quickly over extensive areas, and thunderstorms are common.

(2) In northerly airstreams which bring cold air directly from the pole. This air is very unstable, with cumulonimbus clouds frequently coming in off the sea to exposed north, west and east coasts. This is more usual in winter than in summer. Between the Cbs the air is very clear with excellent visibility, and flying might be quite safe. But be very careful, if you see them upwind approaching the site. They can come in at an amzing speed!

(3) Along a well marked sea breeze front in summer there is a region of convergence where the offshore wind meets the incoming sea air. This convergence creates lift at the front which is sometimes capable of breaking down a shallow stable layer above. Before the front approaches, the stable layer prevents large clouds from forming above the thermals below. But as the convergence pushes air right through the stable layer, it sometimes comes out into unstable air above and grows upwards forming a Cb. (See *Wings!* October 1979, p.20). This can happen suddenly, and pilots should always be aware of it should things start to get rough. It's not much fun when the smooth and extensive lift in the convergence is replaced by the vicious downdraught of a cumulonimbus!

Having said all that, it should be patently obvious that the Cb is a very uncompromising feature with the ability to destroy a hang-glider! Turbulence, freezing temperatures, ice formation over the wing, structural failure, instrument error — the cumulonimbus causes the lot. Be sure you know how to recognise them, and NEVER treat them lightly. You should always think very carefully about flying whenever such clouds are around.

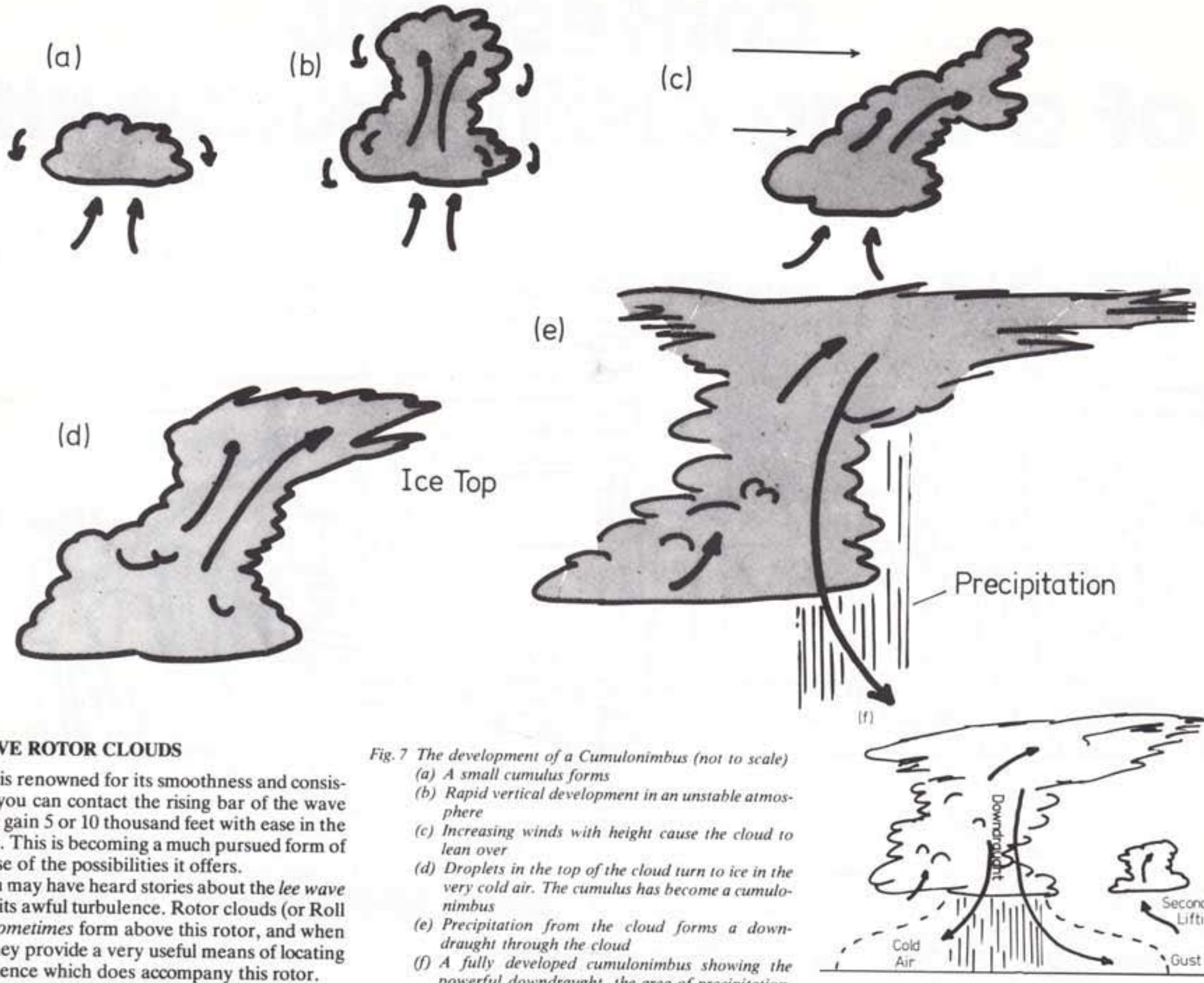
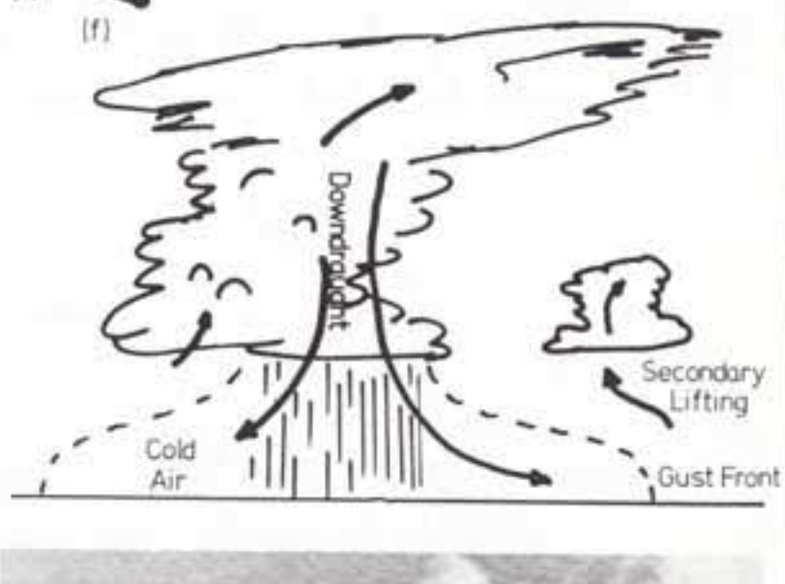



*Fig. 7 The development of a Cumulonimbus (not to scale)*
*(a) A small cumulus forms*
*(b) Rapid vertical development in an unstable atmosphere*
*(c) Increasing winds with height cause the cloud to lean over*
*(d) Droplets in the top of the cloud turn to ice in the very cold air. The cumulus has become a cumulonimbus*
*(e) Precipitation from the cloud forms a downdraught through the cloud*
*(f) A fully developed cumulonimbus showing the powerful downdraught, the area of precipitation, the gust front, and the secondary lifting ahead.*




## LEE WAVE ROTOR CLOUDS

Wave lift is renowned for its smoothness and consistency. If you can contact the rising bar of the wave you could gain 5 or 10 thousand feet with ease in the steady lift. This is becoming a much pursued form of lift because of the possibilities it offers.

But you may have heard stories about the *lee wave rotor* and its awful turbulence. Rotor clouds (or Roll Clouds) *sometimes* form above this rotor, and when they do they provide a very useful means of locating the turbulence which does accompany this rotor.

Let's look once again at where this rotor forms. Fig.8 shows a lee wave system forming downwind of a ridge with smooth almond-shaped lenticular clouds forming in the crests (highest points) of the waves. Note the position of the rotor. In the rotor zone the air is normally very turbulent, but if cloud does form, the condensation causes great instability and the turbulence becomes severe. The difference between the roll cloud and lenticulars above is pronounced so it is quite unmistakeable. But the roll cloud could be mistaken for a cumulus cloud! You'd have quite a shock if you were to head straight for this one expecting a big up! Avoid it at all costs.

Remember also that the rotor cloud doesn't always form, so be prepared to turbulence in the rotor zone well below the lenticulars even if there is no rotor cloud.

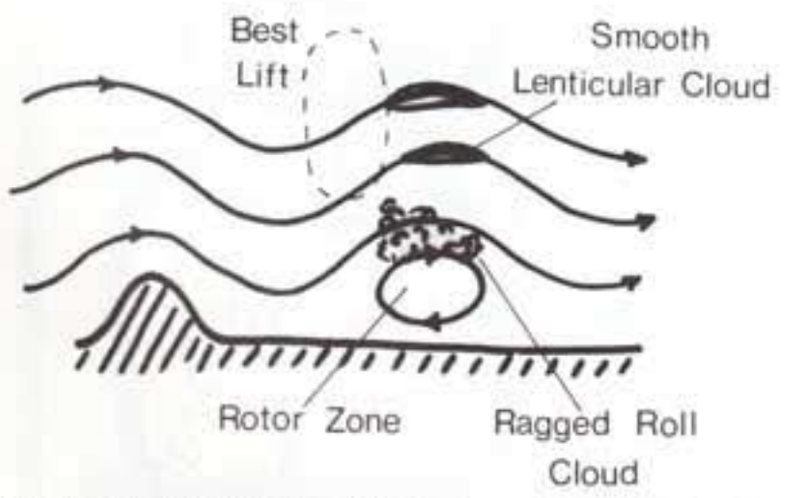



*Fig. 8 Lee wave system and Rotor Zone downwind of a ridge. Note the positions of the lenticular clouds and the Roll Cloud (when it forms).*

## CONCLUSION

These two articles on dangerous clouds are really nothing more than an introduction. To recognise clouds, to understand the reasons for their formation and dissipation, to appreciate the atmospheric motions around them, and to use this knowledge prudently in your flying all takes time. The more you learn, the more you'll want to learn, and your flying will improve accordingly.

There are some good books on clouds. Ones I would recommend are:

*Clouds of the World* by Richard Scorer, David & Charles, £12.60. This is a beauty! It is expensive, but it's glossy, full of magnificent pictures, and there is a very explicit text explaining the various cloud types and formations. Every club should have a copy.

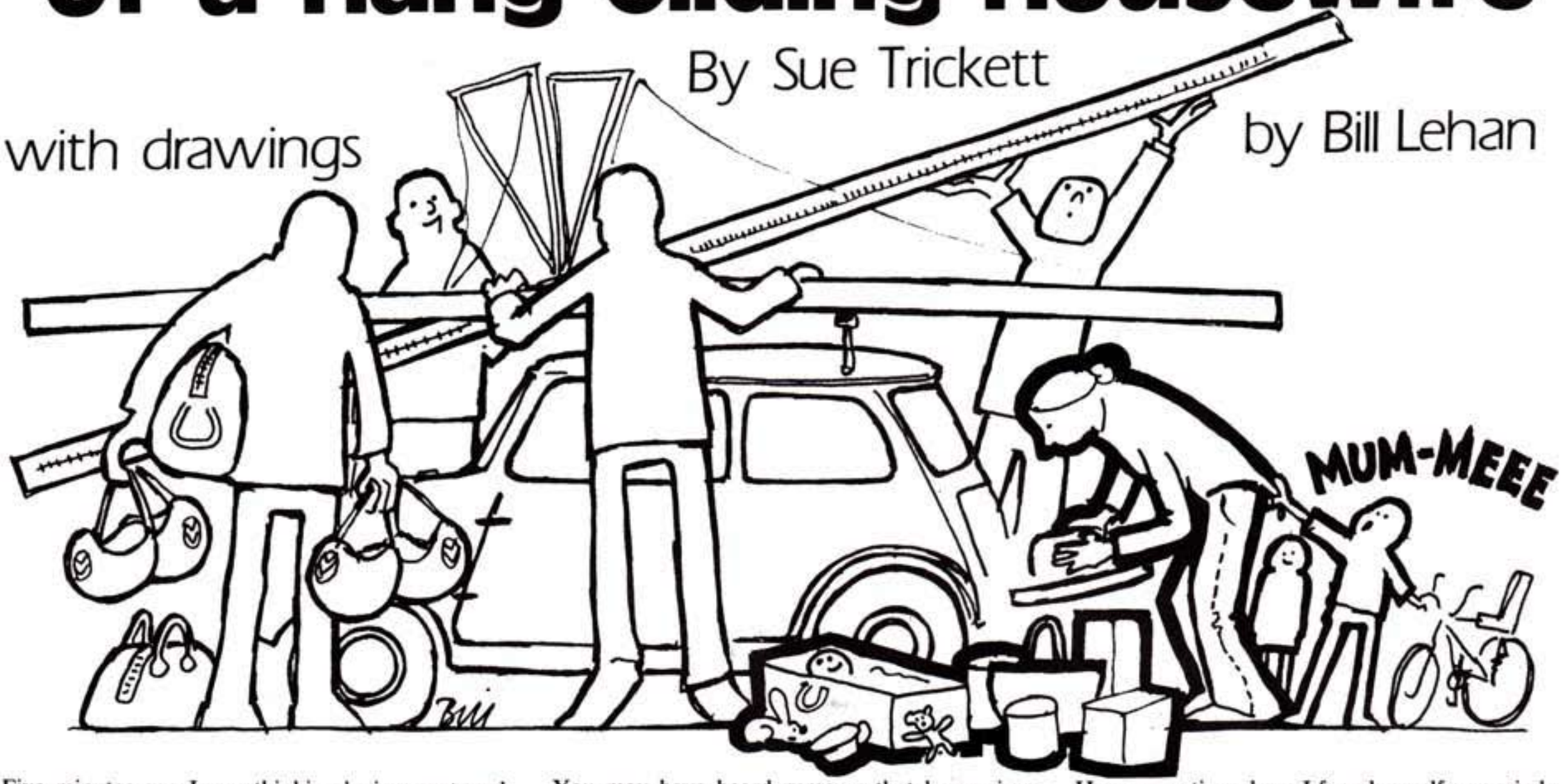
*Cloud Study* by F.H. Ludlam & R.S. Scorer, John Murray, £1.50. If it is still available this is a nice alternative for the individual. Again, it emphasises the *reasons* for cloud formation rather than the long-winded classification of types. Plenty of good pictures.

*Pilot's Weather* by Ann Welch, John Murray, £4.75. A very readable book with lots of cloud pictures. A good all round Met book for flying. Just a little bit weak on some of the explanations.

# Confessions of a Hang Gliding Housewife

By Sue Trickett

with drawings by Bill Lehan




Five minutes ago I was thinking loving, maternal thoughts of my children, three of them, two girls and one boy, and now I find myself with pen in hand attempting to put down my somewhat incoherent thoughts on paper. And what brought this about? The sudden realization that my children are not mere babes in arms, but potential hang gliding ground crew or perhaps . . . horror . . . potential pilots! Can I stand the strain of three more enthusiasts in addition to the one nut, in the guise of a husband, that I already have? I was even all but persuaded to call our third child, had it been a boy, Chargus. The poor wee mite was saved this fate by being born a girl, and fortunately Firebird did not really suit her!

you'll never know what a lucky little girl you are!

...all but persuaded, if it was a boy, to call it 'Chargus...

You may have heard rumours that housewives spend their time having coffee mornings, wasting their time gossiping about Mrs. So and So around the corner. Well, in my case this is partially true . . . I frequently have coffee mornings, tea afternoons and beer drinking evenings, not with the housewives, but with all the local hang gliding cronies. I waste my time gossiping about 360's, top landings, varios, Dennis Pagan, thermal underwear and, of course, the weather. Good God, I must be cracking up! I must be the best educated hang gliding housewife in the country. I know what a stall is, how to avoid it on take-off, I could write a thesis on rotor effect, my knowledge of A-frames, B-bars and prone conversions is immaculate and just try me on winch-launch techniques.

Fortunately, or unfortunately (depending on which member of the family you are), our kitchen sink is right by a window. To wile away the boredom of washing-up, I find myself assessing wind strength and direction (using all the tricks of the trade, of course . . . grass, smoke, washing etc. etc.) and then rushing out to check my estimates with the ventimeter. "Ah ha . . . south-easterly, 15 knots; the 'team' will be home early from work." And sure enough, they arrive, all four of them, trying to strap two kites to the roof-rack and gather together the requisite tackle in the shortest possible time. I give up and just hand them the thermos of hot coffee, try to get the message through to my dear husband that dinner is at five, and get back to my secondary role of housekeeper. Sometimes, if we are really *lucky,* the kids and I go too, which involves taking even more equipment with us . . . potty, nappies, toys, sweets, juice, tissues.

"Mum, can I take my bike with me?"

"What!"

*"Please."*

or...horror...potential pilots!

How many times have I found myself on a windy hillside watching straight-downers, soaring, good landings, bad landings, top landings, tethered flights, seated flights, prone flights and sometimes, even when highly pregnant, acting as 'wire-woman'? And what do I get at the end of it? Can you patch/wash my jeans again? Once, which shows true manic tendencies, I even patched an old rogallo which was jammed half in and half out of the front door, while I was similarly jammed up against the kite and the living room door.

Our current abode in Shetland is only for another 18 months, so what could be nicer, than planning our next move?

"I have always liked East Anglia,"

"East Anglia is flat, woman!"

Do I get any say in the matter? Of course I do. I can live on, near or by Milk Hill, Rhossilli Bay,

South of France or California. But when I voted for either of the last two, I was told not to be so foolish, so it looks like Milk Hill here we come.

Living in such an environment of extreme hang gliding worship has brought me to my ultimate commitment. I am putting it in writing so that you will all know and there can be no going back.

1977 was the year it started;

1978, the year of the first kite;

1979, the year of the second kite, of the discovery of thermal knickers and of the vario (yes, I even bought him one for Christmas)

1980, I am told, is going to be the year of the blob;

1981, the year of cross country and . . . wait for it . . .

**Sue Trickett predicts that 1982 is the year of Sue Trickett!** If you can't beat 'em, sod it, join 'em. I am going to fly, top land, 360° and all the rest of it and, who knows (Bob Calvert be warned) I may even enter the league!

Possible, or just a pipe-dream? Well here is one hang gliding widow who is going to try and fight back and all you flying freaks out there, particularly my totally addicted husband, don't say I didn't warn you . . .

**'82 FOR SUE**

# SMALL ADS.

**All small ads should be sent to Silvia Howard, Commercial Editor, *Wings!*, 4 Somerwood, Rodington, Nr. Shrewsbury, Salop.**
**Ads sent to any other address will be redirected and therefore delayed.**

**For your own safety, if you are puchasing 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.**

**SKYHOOK SAFARI.** Excellent condition. Red and yellow with white tips. Never been bent. Suitable for P1 upwards. £400 o.n.o. Owner buying 'Silhouette'. Phone Bill Anderson, Arbroath 75546 evenings only.

**SKYHOOK IIIA.** Complete with seated harness. Used only twice. Dismantles into 6ft. lengths. Ideal for beginner. £160 o.n.o. R. Crutchley, 39 Cathwaite, Paston, Peterborough.

**SUPER SCORPION C.** Late model (September 79) with 166 Windmaster sail and improved performance. £550 o.n.o. Why sell so soon? I'm getting Vulcanised! Ian Trotter. 031-552-7736.

**CYCLONE** brand new. Test flown. White dacron with red leading edges. £350. Tel. day 07062 4635; evenings 07062 5808.

**MIDAS SUPER E. KD model.** Superb flyer in tasteful colours. Now have Skyline, so only £250 o.n.o. for quick sale. Kendal 28357 (evenings).

**SST.** Good condition. High performance, rigs seated or prone. Complete with bag and seated harness. £300 o.n.o. Tel. Warrington 61891.

**CHARGUS CYCLONE 180** flown twice by owner. £350. Wasp prone harness £40. Hiway seated harness £20. Elstead (Surrey) 702514 evenings.

**WANTED.** Secondhand SPIRIT (Medium). Tel. Blackpool (0253) 891226.

**GRYPHON 160.** Excellent condition with little airtime. Real bargain at £400 or will swop for Cherokee, Skyline, Vortex or other kite of similar performance. Tel. Blackpool 52724, ask for Paul.

**CYCLONE 180.** Distinctive sail colours, red-white-blue. Clean sail (no flap on trailing edges near tips). Experienced pilots only. £395 including spares. Must sell. New glider on order, hence price. Ring E. Horsfield, 01-684-4772.

**BREEN** high fly. Blue white and yellow sail, with harness and helmet. £110 o.n.o. Tel. evening 01-460-7586.

**HIWAY SPECTRUM** (small). Little used, good condition. Never pranged. B bar and seated harness. £300. Tel. Swansea (0792) 793281.

**VORTEX 120.** One flight only. Almost as new; with helmet and seated harness. Any offer considered for quick sale. Tel. Durham 68805 (evenings) or Durham 64971 ext. 492 (daytime). Andy Strong.

**BIRDMAN CHEROKEE.** 3 months old, less than 4 hours airtime. Custom gold/tan sail. As new. £475. Dunstable prone harness, most comfortable, easiest to get into, £35. RAF altimeter £25. "Winter" airspeed indicator £25. Bill Allen, Cheltenham (0242) 28989 evenings.

**HIWAY SUPER SCORPION C.** Superb soaring, thermalling machine — can be seen flown. £450. Elstead (Surrey) 702514 evenings.

**ELECTRA FLYER CIRRUS III.** Immaculate US built intermediate. Light blue leading edge pockets and tips, white yellow gold orange from keel out. Seated/prone rigging. Trimmed hands off. £300. Cornwall. Tel. Rumford (81934) 596.

**FALCON 3.** Hand built BHGA reg. Good soarer, with bag and seat. £180. Tel. Loughborough 39039.

**COBRA 222.** White yellow orange. Ideal for beginner to intermediate flyer, with seat and bag. £160. Would swop for Cobra 200 or similar. Tel. Loughborough 39039.

Swop Honda 125S CB L reg. for intermediate glider or sell £120. No MOT Tel. Loughborough 39039.

**CHEROKEE 200 (Medium).** My devotion to its design team forces me to sell this beautiful ship. Very good condition and performance to take you through 1980. £480. Ring Brian Godden on 01-580-2439.

**Magic MOYES MAXI III.** Flown in 78 Americas Cup by Biff Huss. White centre/yellow/orange/brown/black. Beautiful glider. Bargain £300. Tel. Mick Evans, Haywards Heath (0444) 55049 or 52682. Reason for sale, too many gliders!

**SST 100B.** White, light and extremely pleasant to fly. Excellent pilot one first glider. £250. Tel. Loughborough 30218 evenings.

**SCORPION C** — factory competition special — very low sink. £325 or thereabouts. B-bar available. Bob Fisher, Reading 864066.

**FALCON IV.** Multi-coloured sail. Only 3 flights in last 18 months. £260 o.n.o. Geoff Symes. Phone Poole 5100 ext. 239, or after 4 pm, Parkstone 747939.

Ex-University (Physics) Pilot, 1 weeks employment in hang gliding. Please send details to Mike on 0509 61396.

**Large MOONRAKER 78.** Very good condition. No prangs, must sell. £300. Tel. Terry, Leiston 831027.

**White SST 100B.** Perfect condition. £325. White ATLAS medium. Perfect condition. £550. Sale due to Australian trip. Contact Mr. G. Salmon, Farnborough (Kent) 54834.

**WASP FALCON III.** Red and White sail. Good condition. £200. B. Gardiner, Stoke-on-Trent 319109 or 325359.

**SPECTRUM (Large).** Perfect condition. Any trial welcome. Seated harness included. £365 o.n.o. More details on Burgh Heath (Surrey) 58518.

**CYCLONE 180.** Purple and white, in almost new condition. Must sell. £395. R. Bird, Warwick 496314.

**CLOUD 9.** Chordwise battens. Rigs seated or prone. Very good condition. £180 including bag. Tel. Pete, Great Missenden (02406) 3612.

**Medium SPIRIT.** Needs some attention, hence £90. Brand new prone harness, medium size. £40. Romer helmet. £5. Phone Ken, Rochdale 30919.

**FLEXIFORM SPIRIT.** Very good condition. No accidents. Suit 10-12 stone pilot. Handles exceptionally well. Business commitments force sale. £170 o.n.o. Phone Day: Mike Ross, Stockport, Cheshire 061-223-1341. ext. 364.

**VORTEX 120.** Excellent condition. Multi-coloured sail. Flies seated or prone, suitable pilot 1 or 2. £325. GRYPHON III. Good condition, assymetric sail colours. Flies in any wind. £200. Phone Medway (0634) 241095.

To provide an accurate assessment of the number of RAF Hang-Gliding pilots and hopefully attain official recognition for the sport would all RAF personnel hang-gliding please contact me: Flt Lt R.E. Holden, 9 Regiment AAC, BFPO 41.

**FALCON IVB.** Breakdown model. Multi-colour sail. Unpranged. Little used. Inc. bags. £260. New FALCON 3 control frame uprights £5 each. FALCON IV Cross boom £5. King post £3. Phone Worcester 830308.

**WANTED.** Recent second hand VORTEX and prone harness at around £350. Phone Leeds 622163.

**SUNSPOT (small).** Stability, sturdiness and safety make it ideal for newcomer, wanting to shine. Floats well. £310. (Manchester area). Seated or prone harness available. Ring Mark 0782 29681 ext. 3014 (business hours).

**CYCLONE.** Superb glider in every way. Stays up with the best and outglides them all. Genuine reason for sale. Give away price £325. Phone Dave, Mansfield 752609 (work).

**WILLS WING XC 185.** Flies like a dream. Suit pilot 2 from 10 to 13 stone. Pilot 1 to Pilot 3 only please. £350 o.v.n.o. Ron Freeman. Tel. Ashington (Northumberland) 816835 or work 813254.

**MOONRAKER 78.** Medium high performer in excellent condition. Must sell to finance new project. £350 o.n.o. Tel. Mike Evans, Weybridge 49134 between 6 pm and 8 pm.

**MEDIUM SPIRIT.** Suit 9-12 stone beginner. Great glider in good condition with spares and harness etc. £200. Tel. Mike, 061-205-6621.

**MEDIUM SKYLINE.** Excellent condition. Little used. Must sell. Starting a family. Bargain at £420 o.n.o. Also extras. Ring 0952 813289 for details.

**WANTED.** Beginner's hang glider for my brother — 12 stone. Must be cheap. Repairs not objected to. Allan on 0632-673417.

**SUNSPOT.** Suit pilot up to 11 stone. Good condition. Excellent thermaler (e.g. 21 mile cross country last year). Easy handling machine for pilot one or above. Offers. Phone Martin Pingel (0222) 388147 (day).

**SOUTHERN HANG GLIDING CLUB Parachute Seminar.** 6 pm Devils Dyke Restaurant, Saturday 8th March. Also film and P2 exams. Open invitation to all BHGA and Club members. Experts invited too! Any Queries contact Vince Hallam, Brighton 24151, Ext. 171.

**BIRKY'S WINTER CLEAROUT.** Gliders at give-away prices! MOONRAKER 78. Medium blue/white. Good condition. £250. SAFARI. Medium, orange etc., good condition. £295. PHOENIX 8. Medium, yellow, red, blue. Average condition. £195. PLIABLE MOOSE ELITE. Interesting project for good flyer. Excellent condition. £100. Contact Trevor Birkbeck, Ripon 5540.

1 brand new EMU, test flown only. £380. 2 s/h VECTORS, excellent flyers, £150 each, including prone harnesses. 1 s/h large SPIRIT, complete new airframe and seated harness. £280 o.n.o. Phone Hughie on Bolton (0204) 68838 after 6 pm.

Following a decision by Council on 13th January, beginning with the April issue of *Wings!* a charge will be made for *classified* and *business* adverts, which up to now have been free.

There will be three different types of small ads. *Personal* messages, such as "found on hill, one vario, etc", in which there is no profit for the person putting the message, will continue to be free. *Classified* advertisements, such as the sale of gliders, will be carried at 10p a word, including one word in bold type, and the minimum charge — *which must be pre-paid* — will be £2 an advertisement.

*Business* ads, like *Mainair,* will cost 12p a word, minimum £3, no maximum.

The reason? *Wings!* is running at a big deficit, and needs to introduce normal commonsense measures to cope.

The restrictions on advertisements for gliders which have not gone through the British Airworthiness scheme remain in force, in line with last year's AGM decision.

**For FREE LIFE ASSURANCE QUOTATIONS** with special consideration for BHGA members, contact Ariel Insurance Agency, 32 Torquay Gardens, Redbridge, Essex, 1G4 5PT.

**NEW PARACHUTES** Strong, compact, low sink rate, ringle handed "Throw Away" deployment. Competitively priced. Phone or write for details. Skyhook Sailwings Ltd., Vale Mill, Chamber Road, Hollinwood, Oldham, Lancs, 0L8 4PG. Telex 667849. Tel. 061-624-8351, 681-5045 or 5369.

**THE HALF MOON HOTEL, LLANTHONY, ABERGAVENNY, GWENT.** Situated in the valley behind Hay Bluff and Pandy Run. Friendly atmosphere, good food. Free house, party bookings catered for. Phone Sonia on Crucorney 376 or write for information.

**DERBYSHIRE** cottage (High Peak village) available April-October. Accommodates 5. Easy reach of classic uncrowded sites for all wind directions. (Mam Tor 15 mins!) Free advice from local fanatic on the best flying around. Lots of alternatives to keep the family happy! Details: Tel. Tideswell (0298) 871289 or write Len Hull, Cressbrook Hall, Cressbrook, near Buxton, Derbyshire.

**LAND AVAILABLE FOR CAMPERS** on farm close to Devils Dyke — Mill Hill — Steyning Bowl. Charge £1 per pitch per night. Badger Wood Farm, Clappers Lane, Fulking, near Henfield, Sussex. Tel. Richard Viner, Poynings 369.

**INSTRUMOUNT** — Vario Mounting Stalk. Secure and instant Instrument fixing — £11. Makiki — Pellet Variometer — amazing at £35. Hang Gliding and Glider Rider — Subscription £14.38 each. Parachutes — Spares — Components — Windmeters — Harnesses. Who else stocks 8 types? Helmets — Boots — Thermal wear — Ski Suits and over 500 lines. If you fly you need a Mainair 1980 catalogue. Send large s.a.e. plus 50 pence (refundable against purchase). Mainair Sports Ltd., Shawclough, Rochdale, Lancs.

Secondhand gliders, instruments etc. Mainair Exchange & Mart. Ring 0706 55131 with details of sales and wants. We will pass on to customers. FREE SERVICE TO BHGA MEMBERS.

**DON'T BUY BEFORE YOU FLY!**

The Peak District Flight Training School has facilities to enable you to test fly several different models before laying down the cash. All good breeds of glider can be supplied. Part exchange always possible. Second-hand gliders available.

**AGENTS FOR HIWAY AND OTHER LEADING MAKES OF GLIDERS**

Ring 053834 231 or 308 and speak to Alan Hetherington or Malcolm Hawksworth.

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*Telphone:*
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**WANTED.** Myself and another pilot require 1 more to fly with us in the OWENS VALLEY from about June 28th for 3 weeks. Shared expenses will bring cost to around £600. You must be an experienced thermal pilot with a lot of air time and preferably live around the North West area. Contact Mick Pollard, 16 Liddell Road, Liverpool, L12 7HS (051-226-7342).

3rd generation hang glider for £390. Core thermal. Beautiful 'rig' in minutes. Good condition (pilot 1 or 2). It's an EMU 195. Tel. Jerry 06962-3531 (Yorks).

**THE SOUTH WALES HANG GLIDING SCHOOL** offers special courses to prospective instructors and training for Pilot One holders. Phone Ynysowen (0443) 690787.

**BOWLAND ALTIMETERS** £17.50 57mm diameter × 33mm. Black numbers on white face to 8,000ft. Sussex College of Hang Gliding, Brighton 24151 ext. 171.

**SST 100C.** Green, yellow and white sail. Hardly flown, condition as new. Seated and Hiway prone harness, Galaxy helmet. £365 o.n.o. Tel. Crewe (0270) 663416.

Classified Advertisements — 10p per word, including one word in **Bold,** minimum charge £2.00.

Business Ads — 12p per word, minimum charge £3.00.

**All** advertising must be pre-paid.

Send to Commercial Editor, Sylvie Howard, with a crossed cheque or postal order for the correct amount, made payable to the British Hang Gliding Association.

Personal Messages from BHGA members carried free.

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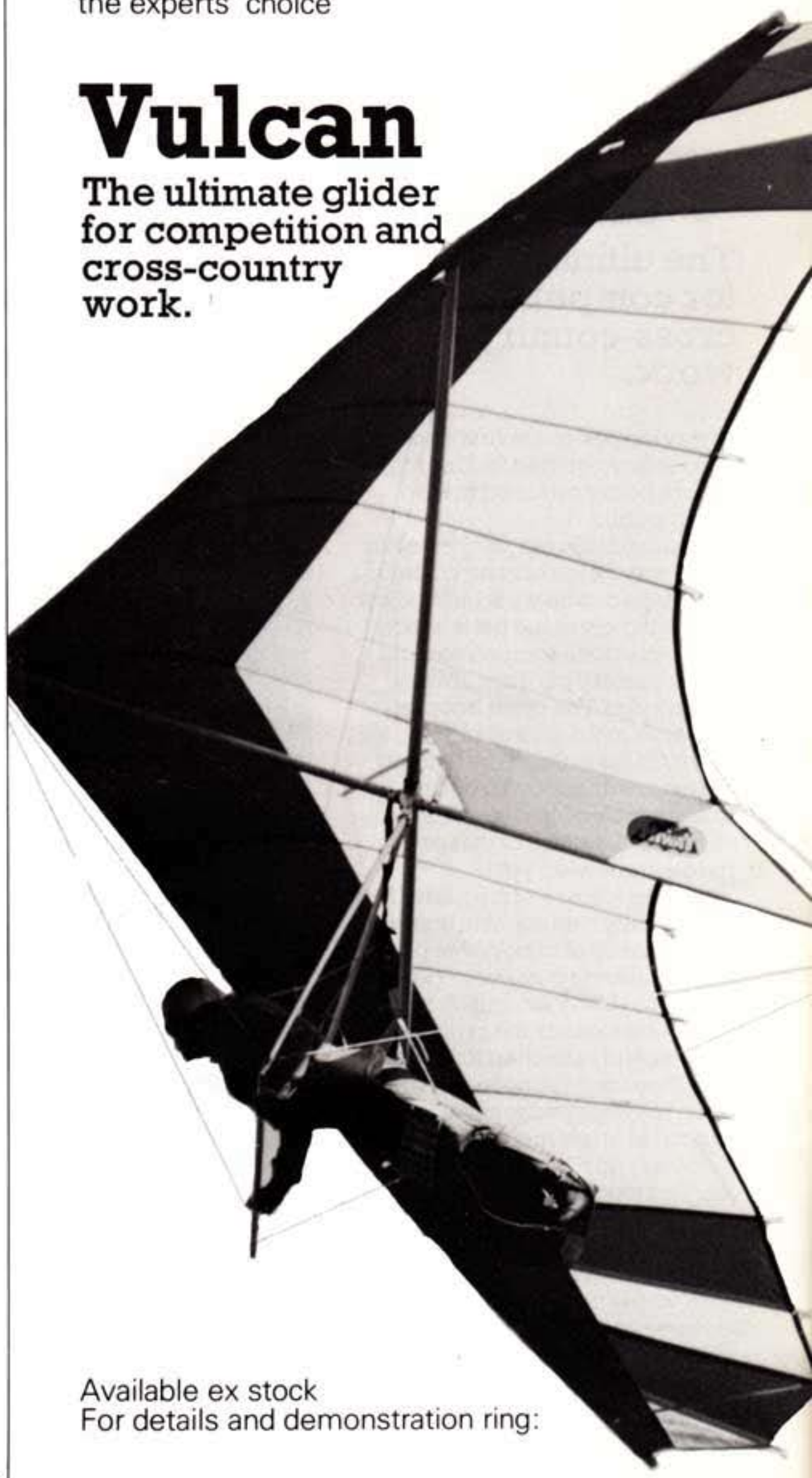

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ANY saleable glider accepted
in part exchange

# Vulcan

## The ultimate glider for competition and cross-country work..

Hiway introduce the first glider ever to have gained its C of A before being released to the flying public.

Vulcan is the top performer in the Hiway range of hang gliders. High aspect ratio wedded to a low twist wing gives the penetration that the serious competition and cross-country pilot has always dreamed of. The cross boom is moved into the slower moving air closer to the sail and the leading edges are thus freed from this drag inducing structure. The absence of deflexors makes this the cleanest wing yet.

The hardware of the glider has been totally rethought in line with the demands of tomorrows pilot. Vulcan is even quicker to rig than previous Hiway models. A sliding centre box leaves the cross booms permanently attached to the leading edges and the nose catch has been re-designed to give quicker and surer attachment. A removeable king post boss prevents tangled top wires and a re-designed 'A' frame with straight uprights means they can be easily and cheaply replaced.

A whole new barrage of safety devices is incorporated including, improved tip strut mounting, anti-luffing wires and a fool-proof hang strap system.

Vulcan is not only streets ahead in performance but retains the legendary handling that Hiway is known and trusted for.

**Hiway Hang Gliders Limited**
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HIWAY