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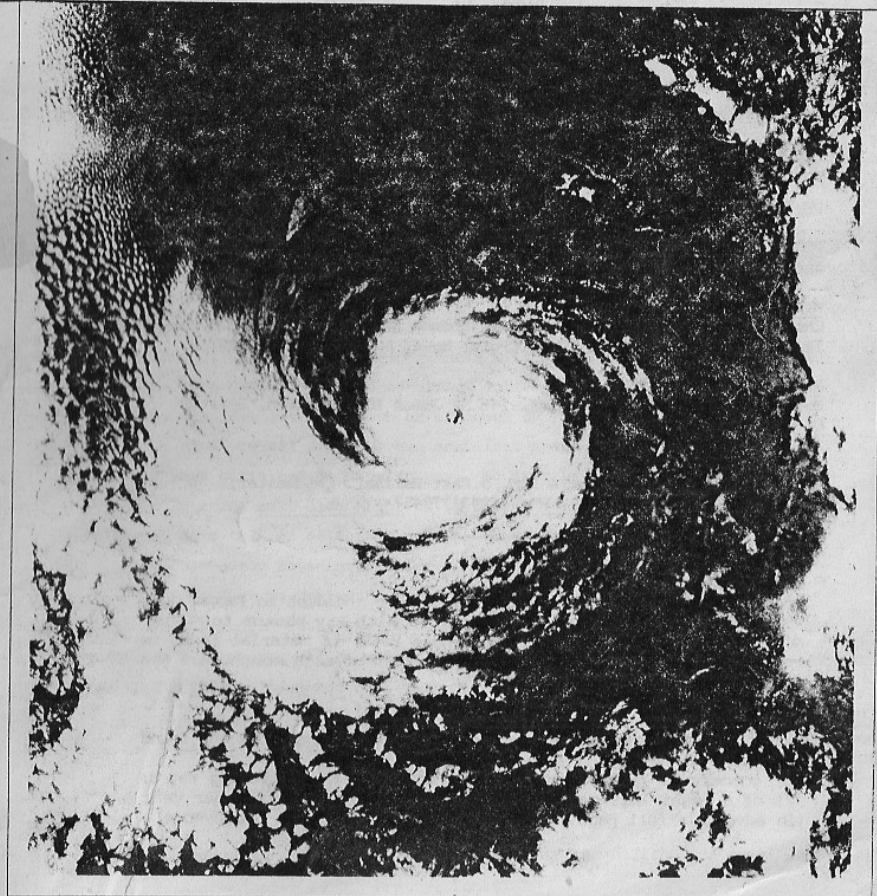
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If you have an interesting story to tell or accident to report just write it down clearly and send or give with any photos to either of the editors. Please send a S.A.E. if material is to be returned. All items must be in by the 25th of each month, for the following months' magazine.

ADVERTISING

Private advertisements for members (to sell gliders, lost and found etc.) are free.

All commercial advertisements are charged at the following rates:
1/6 of a page: £12 per year (in advance); 1/3 page: £22 per year (in advance); full page £5 per month, or £45 per year (in advance).

Editorial

The Inter-Club competition between ourselves and the South Devon Club took place over the August Bank Holiday weekend. The Thames Valley 'Raiders' and the Avon Club didn't turn up, probably due to the uncertainty of the weather forecast. However, flying took place on two of the three days, ending with a classic day at the Dyke with about 30 pilots scattered over Sussex and Kent as far afield as Dymchurch, 53 miles away. We won the competition but our opponents were very keen and full of the 'go for it' spirit; they had beaten everyone else they had challenged up till then. All in all it was a good, fun weekend's flying with the competition atmosphere pushing pilots into making the very best of the conditions on the day.

Probably the best day in British hang gliding cross country history to be realised was Friday 6th September at Wether Fell in the Yorkshire Dales. No less than six pilots at the League Final flew over 100 miles. One of them, Peter Hargreaves, set a new unofficial British XC distance record by flying 132 miles. Another pilot, Jes Flynn, flew 131 miles. Both were apparently only stopped by the sea! Many other good distances were flown that day, the best from our Club being Dave Rusbridge with 85 miles.

As I mentioned in the last WINDSOCK, towing is gaining more and more in popularity. One of its latest fans is Gary Hume who kindly sent in a long article describing his experiences of learning to tow, and which you will find in this issue. If anyone has any interesting and/or unusual stories to tell, why not just jot it down as it comes to you. Otherwise Chris and I will have to bore you all with our own articles! Apart from which it's good fun reading what other people have to say. So send it in today.....

The next Club Night is on SATURDAY 5th. OCTOBER at the Dyke pub and will be a talk on meteorology as applied to gliding and hang gliding by RAF Gliding Instructor David Bilcliffe.

Just to remind P1 pilots: the bottom landing field at the Dyke is still currently open until such time as it is ploughed up again. Perfect your approach and landing techniques whilst it is easy to do so; after it is ploughed up, you will have to leave the hill with sufficient height to cross the road and negotiate with the power and telegraph cables. All the grass covered fields across the road are still available for you to land in.

Happy landings all,

Ian CS.

Front cover: satellite shot of Hurricane Katrina off the Californian coast in September 1975. Pretty, innit?

From PILOT magazine:

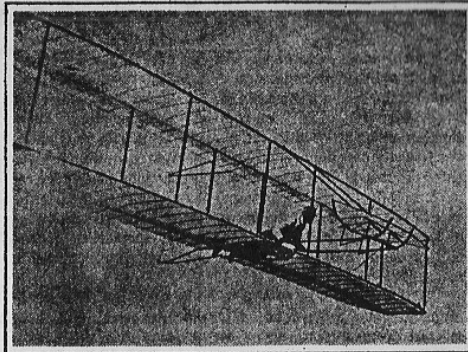
Changes to Danger Area, ATZ rules

Changes were introduced in April to the rules governing warning signals to aircraft in the vicinity of Prohibited or Restricted areas, and to the application of Aerodrome Traffic Zones (ATZs). Hitherto the UK has differed from ICAO standards in the signals used to warn aircraft, and in their application to Danger Areas which have previously been excluded. Now the rule which required an aircraft to land following an unauthorised penetration of a Restricted or Prohibited area has been deleted, and replaced thus:

"In the UK, by day or night, a series of projectiles discharged from the ground at intervals of ten seconds, each showing on bursting red and green lights and stars, shall indicate to the commander of an aircraft that his aircraft is flying in or about to enter an active Danger Area or an area to which regulations made pursuant to Article 66(1) (a) (iii) of the Order relate, (ie Prohibited, Restricted Areas) and that he is required to take such action as may be necessary to leave the area, or change course to avoid the area."

Changes to the definition of ATZs and to the rules relating to flight in the vicinity of aerodromes mean in effect that ATZs will exist only at Government aerodromes, licensed aerodromes with air/ground communications and aerodromes with an ATC or AFIS unit — that is, where permission must currently be obtained prior to entering the ATZ. Those aerodromes currently protected by an ATZ, but where permission to enter is *not* required, will in future not have ATZs. However, say the CAA, "the common-sense collision avoidance rules applicable at all aerodromes" should be followed. At Government aerodromes the ATZ will exist at all times, but at others it will exist only during the hours of the qualifying service provided to pilots and detailed in the *UK Air Pilot*. The CAA say the result of these changes will produce a situation in which all the ATZs in the UK are positively identified and listed for the benefit of pilots, who will know where they are and that one set of rules applies to all of them.

From the Archives, this classic photo:



Wilbur Wright flying prone in the 1902 glider. This was the most successful flying machine to that date because it used the Wright-invented aerodynamic controls.

Mark Woodhams is the Hiway representative in the south-east, living at 60 Compton Road, Brighton. Telephone Brighton (0273) 501 043. Excalibur 177 for sale. Rainbow undersurface and stinger, £900. Fantastic Vision demonstrator available for demo flights.

SMALL ADS

FOR SALE: Lindsey Ruddock digital vario Mk V. White case £30 update. Just checked in perfect condition throughout £110. Ring Eddie 01-684-7427 (Croydon).

FOR SALE: GYR 188, Good condition, with harness, vario and several books on hang gliding. £650 ono. Phone Chris 01-778-0796 (South London).

FOR SALE: Secondhand SUPP. Good condition. ½ price. Contact BJ on 0273-698906.

FOR SALE: Phantom (Atlas type). Excellent condition. £675 ono. Brighton 416871

FOR SALE: Superscorpion 2C. Yellow & green. Good P1 machine for pilot 11 stone upwards. £335. Phone Andy Webb on Forest Row 3182.

FOR SALE: Gyr 188 Purple with mylar inserts in 1/e. Very good condition. £595 ono. David Wilson, 36 Milner Flats, Brighton, Sussex BN2 2QG.

S.H.G.C. CALENDAR

ALL CLUB NIGHTS TAKE PLACE AT DEVIL'S DYKE PUB.

Here's a couple of dates for your diary:

SATURDAY OCTOBER 5th.

"Lecture on Basic Meteorology for Pilots" by Flying Officer David Bilcliffe, from RAF Kenley. He is an A2 Gliding Instructor and has been flying for 14 years. David has a knack for making difficult and sometimes boring subjects easy to understand with the aid of slides, films and various visual aids.

The lecture will be on 'Basic Meteorology' which will be of great benefit to pilots new to hang gliding or P1's studying for their P2 exams.

If required, he will also talk about more advanced subjects such as flying conditions to expect in mountainous regions, or any other gliding related subjects.

So here's an opportunity for pilots of all levels to pick the bones of a pilot of one of those 'plastic thingies' we see wizzing around the Dyke at Warp Factor 6.

Starts 8.00 pm prompt, Devils Dyke Hotel.

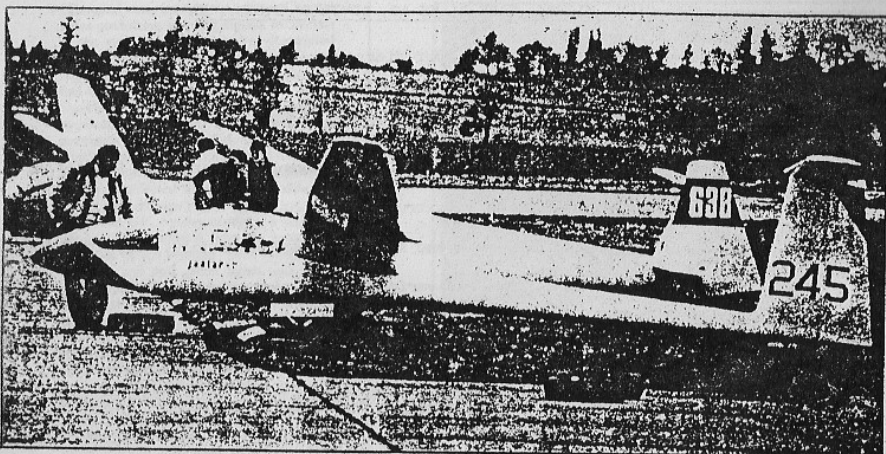
NOVEMBER 2nd (note: NOT Sept. 14th as previously advertised)

David Clayton, B.H.G.A. Training Chairman, will give a short talk on "Flying Experience and Techniques". The talk is, basically, for early P1 pilots desperate for knowledge on all aspects of hang gliding cross country flying. It will be a good chance for all pilots to fire questions at an experienced competition pilot.

8.00 pm at the Devils Dyke Hotel. A light buffet will be available at both venues.

Kevin Pickering

Soc. Sec.



Powerless to fly

Today's high-performance sailplanes, the result of 60 years of design refinement, are probably the most elegant aircraft ever built. Their designers had the primary objective of achieving the flattest possible glide angle, so that pilots could use the air's free energy with maximum efficiency. Flights of more than 1,000 miles, and average speeds better than 195km/hr have been obtained.

This performance has been realised by increasing aspect ratios (to 35 or more) and wingspans (up to 24.5m), and by refining shape, wing profile, and surface finish. The Nimbus 3, for example, has a glide ratio of almost 60, or better than 1". The greatest step forward came with the introduction of glass- and carbonfibre construction, used now for all sailplanes where high performance is the priority.

Unfortunately, these beautiful and efficient sailplanes are not cheap. A Nimbus 3 costs £29,000 (excluding a further £5,000 for trailer, instruments, parachute, *et cetera*). Less-exotic 15m-span production sailplanes, such as the LS-4, are a little over half that amount; even this is enough to put them beyond the reach of many aspiring pilots, even as syndicate members. As a result gliding is growing, numerically, almost nowhere in the world, and the average age of glider pilots steadily climbs.

What is the answer? The reappearance of slow, light, gliders is a solution which some enthusiasts might be reluctant to face. After 60 years of passionate searching for higher and higher performance, any idea of returning to a level which made it a struggle to get round a 100km triangle on a good day is heresy.

This reaction is understandable, and a

The advent of expensive high-performance sailplanes has put gliding out of the reach of many aspiring pilots. Ann Welch considers the need for a new class of grass-roots glider, which could come between hang gliders and the exotic carbonfibre sailplanes.

pilot who is used to exotic sailplanes of superb performance will not want to fly anything else. There is never anything wrong with the continued pursuit of excellence.

What about those who have much less money, however, particularly the young ones? There are potential glider pilots who would be content with less performance just to be able to fly. And are there not a few club pilots who would prefer to potter in the sky instead of chasing 300km triangles? What about those pilots who do fly the exotics, but not sufficiently frequently to operate such fast and heavy ships in safety out of reach of the airfield? These people all want, or need, air time rather than high speeds. To make a marine analogy, is there not a need for some dinghies for those to whom more expensive yachts are out of reach?

There is, of course, hang gliding. These basic craft have developed fast in the last ten years, and can now fly for more than 350km. They have been restricted to hills, as gliders were in the early days, but now that winching and aerotowing (with

microlight "trikes") are coming into use this limitation is departing.

The capital cost of a hang glider is about a quarter that of a very ordinary second-hand sailplane, and in comparison the running costs are negligible. Although some old, and even disabled, people enjoy hang gliding, it is most suited to the young and physically active. From this end of the gliding spectrum, too, there would appear to be a need for something in the middle, to go between high-performance gliders and hang-gliders, just as the sailing dinghy comes between the yacht and the windsurfer.

This wide-open "middle area" is almost empty. A few individuals have ideas, and an even smaller number have turned them into hardware—John Lee and his Lightwing in the UK, for example.

One reason, perhaps, for this void is that big, innovative steps are not often initiated by people who are fully involved in mainstream development. The glassfibre-sailplane makers go for the best possible performance for their price range, and the top manufacturers of hang gliders will do the same. Indeed, they cannot afford the time or money, nor can they risk their reputations, to branch into an unknown market.

Hang gliding was started by people outside mainstream gliding, and if the middle area is to be occupied, this is most likely to be done by new designers with fresh ideas and with no established manufacturing reputations to lose.

What is needed is a coming together of hang-glider technology, and a reappraisal of what was achieved with the light, slow, sailplanes of 40-50 years ago. It is often said that a sailplane with the performance

of a K-8 cannot be made any cheaper than a K-8. This is no longer valid if hang-glider construction is studied and one sees how it has been modified for use in "aeroplane" microlights. Some of these could be turned into quite-effective basic gliders with relative ease.

Rigid-wing hang gliders with three-axis controls, such as the UP Arrow, never became popular because of the difficulty in foot-launching tailed aircraft from hill-tops, where they are also easily blown over. Such problems are reduced with flat-site launching and towing; it is then not a very big step for the pilot to put his feet up and roll off on a wheel.

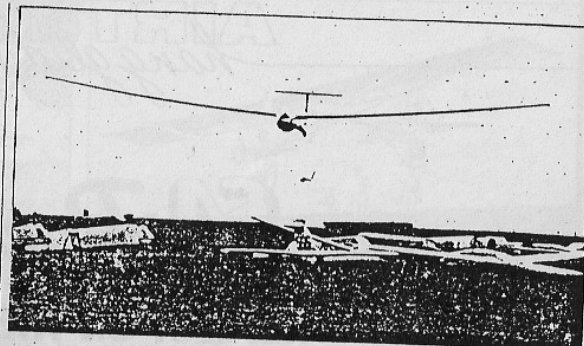
This blurring of the edges of three-axis-control hang gliders and simple, light sailplanes is probably inescapable. The weightshift hang glider will continue to flourish in its own right because it will almost certainly remain the simplest and cheapest soaring aircraft; it also provides great satisfaction to its pilots.

The key questions which concern the light glider, and whether it will find a place in soaring, concern the minimum acceptable cross-country performance, and how that can be obtained at lowest cost.

In 1935 four pilots flew, on one day, the first 500km-distance flights. One of them was Ernst Steinhoff in a Rhönadler, with a glide ratio of 20:1. With a high-lift Cöttingen 652 wing section, it had no high-speed performance; at 45kt its 20:1 would have degraded to, perhaps, 14:1.

In 1983 Larry Tudor flew his Comet 2 hang-glider 359km; glide ratio 10:1 at best. Certainly, today's pilots know more about the techniques of soaring than those of the 1930s, but is this the only reason why the Comet with a glide ratio of 10 can soar a distance comparable with that of the old Rhönadler?

The effective speed range of the hang glider is slightly better than that of the Rhönadler. In both, serious decline of the glide angle is occurring by 45kt; but where the Rhönadler's minimum sink speed was



about 31kt, that of the hang glider is less—some 20kt.

A very low stall speed—and minimum sink speed—makes the hang glider a very effective soaring device. It can circle tightly in the strong cores of thermals denied to the fast sailplane with the latter's appreciably larger turning circle (Fig 1). More circles a minute can be made, which, combined with its ability to manoeuvre rapidly, gives it a better search and sampling rate for best lift.

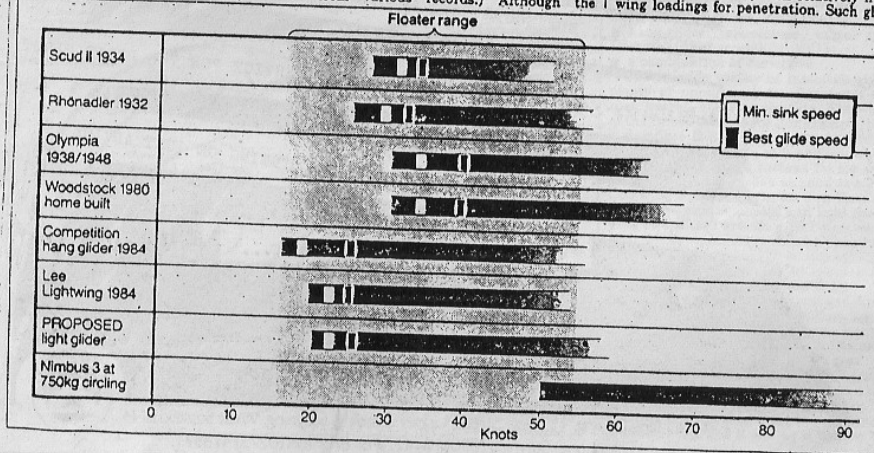
The very slow flying speed also allows it to explore and to use smaller areas of weak (and sometimes unexpected) lift, and the hang glider can continue to soar safely at lower heights because it can easily land in very small spaces. It may always be better than a control glider of the same stall speed in both rapid manoeuvring and small-space landing.

It is interesting to compare the minimum sink speeds and airspeeds for some representative aircraft. (Table A shows some, as accurately as can be found from various records.) Although the

minimum sink speed of the hang glider is about 0.3 worse than that of the Nimbus 3, this is of no great importance if the hang glider can use thermal cores more efficiently. The big disadvantage of the hang glider (or any slow, light, sailplane) is that glide ratios are much worse, and that they cannot fly at anything like the glass sailplane's speed. They make little progress (except downwards) against fresh or strong winds, and so are only capable of triangle flying in light breezes.

Is this a serious disadvantage for the pilot who wants to fly for fun at a price he can afford? Glider pilots could not fly big triangles in strong winds until the advent of glassfibre, but few can be remembered who were unhappy about the flying their old wooden gliders gave—and still give to a growing and satisfied vintage glider community. It was just different.

The idea of a light, cheaper glider is not new, but concentration seems to have been rooted on smaller spans and wing areas to reduce cost, with relatively high wing loadings for penetration. Such glid-



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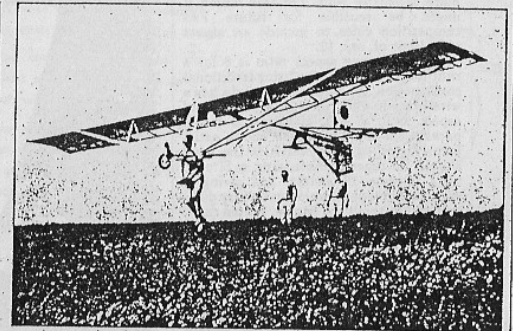
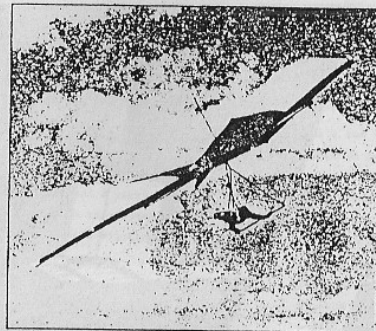
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ers have not been successful, because they cannot compete with sailplanes of better glide performance, nor do they have the ability to float around in weak lift. They are invariably too heavy.

If it seems confusing that the light glider should be as light as possible when sailplane pilots fill up their aircraft with 100-200kg of water ballast to make them heavy, it is the difference between time in the air and speed. If speed is not necessary the glider can, and should, be light, cheap, and simple.

The FAI Sporting Code for Gliding (CIVV Section 3), defines a light (ultra-light) glider as one having an empty weight not exceeding 100kg. If one considers a glide ratio of 20:1, minimum sink 1.4kt, and stall speed of 20kt, the permutations for a light glider (a single-seater, of course) are considerable.

An increase in aspect ratio will lead to a rise in weight, stall speed, and minimum sink. Accept a low aspect ratio and one gets more of a light, slow, "floater". John Lee has the right approach, perhaps,

because his Lightwing gives him easy airborne time in slope lift, thermals, or just subsiding slowly to earth. He has succeeded in avoiding the unsuccessful compromise that has beset so many designers of small sailplanes, and has accepted that what he has is a floater for fun.

Put simply, the choices for configuration of a light glider are tail at the back (conventional), tail in front (canard, including Rutan variants), tandem wing (latter-day Pou), and no tail. It might save time to discard tailless at an early stage, in spite of the savings to be made from having no tail to design, build, pay for, or repair. Tailless aircraft with stick and rudder control have pitch stability complications which, in being overcome, often lead to more drag, or expense, than when there is a tail. They have been tried as aeroplanes, gliders, rigid wing hang gliders, and microlights, but popularity has never been sustained.

It is not anomalous that weightlift hang gliders are tailless. As well as being

c.g. shift, reflex in a soft wing adjusts to increasing speed. Canards and tandem or semi-tandem configurations do work; both in pitch stability and ease of construction. They blow over less easily on the ground, and the pilot also sits nearer the c.g. But none has yet become popular as a sailplane, probably because it is difficult to install the release hook in a position where it will never foul the foreplane. This would not apply to a Pou wing arrangement, but some thorough assessment would be required to make sure that it would remain controllable when being winch launched at a high angle of attack.

To avoid any of the above complications the configuration considered here will be the old, unenterprising one of tail at the back, with no obstructions in the region of the tow hook, and a good pilot view in crowded thermals.

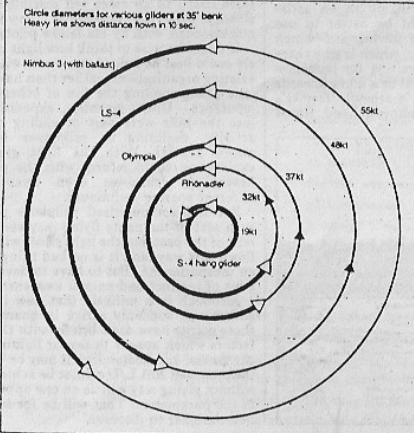
Construction and materials for a light glider come under four headings:

- conventional (including wood, welded steel tube and aluminium tubes and Dacron—the cheapest)
- synthetics (foam covered with glassfibre, or all-glassfibre, such as sailplanes)
- hang-glider (aluminium tubes and Dacron—the cheapest)
- a combination of the above.

Such a wide variety of materials gives plenty of opportunity to play tunes on cost, weight, and complication. The wing of the Sirocco microlight, for example, has a glassfibre D-nose main spar, an aluminium tube "rear" spar, root and tip tubes, and shaped glassfibre battens for top and bottom surfaces. It looks as good as a J-3 Cub wing and rolls up in its own Dacron.

But how simple, cheap, and light can a wing be and still provide a 20:1 glide ratio and 1.4kt minimum sink? The FAI defines the empty weight as a maximum 100kg. Is there any need to make it so heavy? The Lightwing weighs 70kg.

The old adage "simplify and add more lightness" has always been a forlorn hope, so one could go for 90kg with basic instruments, and have an 80kg pilot. At this 170kg all-up weight, a wing area of 14.1m², giving a wing loading of 12kg/m², an increase in span from 11.9m to 13m and aspect ratios, respectively, of 10 to 12 would give a lift/drag ratio improvement of about 1.25. But it will be a heavier or



Top, left to right "Unfortunately, beautiful and efficient sailplanes are not cheap... After 60 years searching for higher performance, returning to a level which made it a struggle to get round a 10km triangle is heresy... Hang gliders can fly for more than 350km... Some microlights could be turned into quite-effective basic gliders with relative ease." Table A (far left) shows comparative air and minimum sink speeds. Fig 1 (left) Hang gliders can circle tightly in thermals denied to the fast sailplane

more expensive wing. For this reason it might be sensible for future FAI competition rules to include an aspect ratio limit of, say, 12.

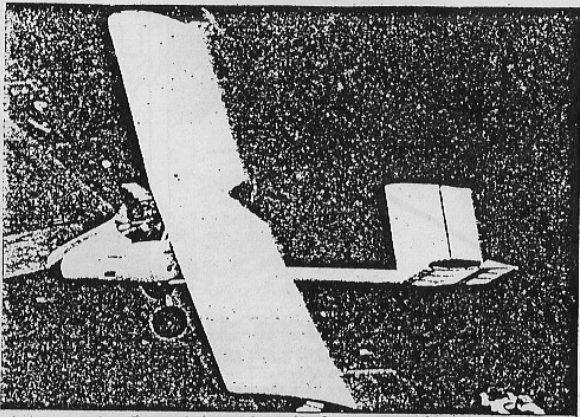
The Lightwing aspect ratio is 8 for a cantilever span of 10.7m using traditional construction; the Sirocco microlight has a wire-braced wing of 10.2m span and aspect ratio of 7.3. However, it has a parallel-chord wing, and to obtain satisfactory circling characteristics the wing should be tapered. Extending a Sirocco wing to, say, 12 metres, and giving it appropriate taper should not be very difficult and, without the engine, should cause no increase in weight.

The fuselage for a light glider offers plenty of opportunity, from the creation of a loving work of art in plywood to a simple tube on to which are bolted "goodies", such as the wing attachment structure, tail, pilot's seat, *et cetera*. Probably the most effective is a simple but elegant glassfibre moulding with integral pod and fin. Built in two halves using polyester resin and stuck together with epoxy, it is not difficult to make and need not be expensive. If the wing is to be braced, the fuselage will need a neck, and if wire-braced a kingpost as well, but both give good pilot protection should the aircraft turn-over.

The tail can be high, low, or vee. The disadvantage of a low tailplane on a glider is that when the wingtip is on the ground so may be the tailplane. A vee tail is better, but could have mixing box complications, particularly for spin recovery. With a tee tail, the most likely problem is torsional stiffness of the fin or fuselage. The temptation to build an all-flying tail would need to be resisted, as a lightly loaded glider gets bounced around enough in gusts without having twitchy controls as well.

Possibly the quickest way to make a workable light glider might be to start with a microlight, such as the Sirocco or Pipistrelle. Development can be done in stages, starting with different wings of similar construction. If the pilot finally wanted an enclosed cockpit, this could be as on the Falcon microlight, with a flexible transparent sheet wrapped round and attached with velcro. There are many possibilities if one does not intend screaming through the air at above 50kt.

Before going further, it might be as well



A quick way to make a light glider might be to start with a microlight

to consider how the light glider may be used. Like any sailplane, it must be quick and easy to rig/derig, with the fewest detachable bits—preferably none at all. Wire bracing inevitably adds complication here. If possible it should be transportable on a car roof, like a windsurfer.

In a complex world, active people like to be free of clutter and the need for helpers; which is not the same as operating together with friends. With some types of construction a trailer may be necessary, and could double as overnight accommodation. If a glider is complicated and slow to assemble it is unlikely to become popular. Obviously, the light glider should be easy to inspect and repair.

Launching by aerotow, winch, car tow, or "bungee" should be free of difficulty. Aero towing behind conventional powerful aeroplanes is unlikely to be satisfactory, and it might be better to use microlight tugs. Car towing and winch launching are cheaper, which is why there are usually queues waiting for launches. Inevitably, there would be a move towards private towing from a friendly farmer's field, because an ordinary Land Rover

would be more than adequate to provide the power. This same independence would exist with bungee launching from hills (except that a new bungee costs over £300). Hand launching would work in winds over 15kt.

Finally, the light glider should, above all, be easy and pleasant to fly. The desire, today, for independence from establishments and bureaucracy should not be underestimated, but for the light glider it could to some extent be counter-productive. Gliding works well because of its club structure, which allows the education of new pilots to be comprehensive. Hang gliding works well because its clubs have made arrangements for using the hills, and microlight and light aeroplane pilots fly from farmland on the same basis. In all cases self discipline is strong, with the occasional "cowboy" quickly dealt with by his fellow pilots.

It might be wise to think how light gliders could best be helped to operate within existing organisations, rather than having lone pilots spoiling the fun of others in ignorance. Until recently, expeditions into the hills were part of gliding club activity, declining as sailplanes have grown heavier. With the light glider, exploration could return, with the pilot having to learn—or even relearn—different soaring techniques.

For the computerised sailplane pilot such seat-of-the-pants flying may seem a relic of the past, but the light glider will be flown this way, and it is no bad thing for an inexperienced pilot to have to develop a bit of instinct and animal awareness.

Although it is unlikely that new light gliders will suddenly arrive in quantity, these points have dealt briefly with those factors which appear to favour lightness, cheapness, and floatability. It may be that the proposed 20:1 L/D cannot be achieved without giving way a little on one or other of the parameters. That will be for some new designer to discover. □

THE GULL

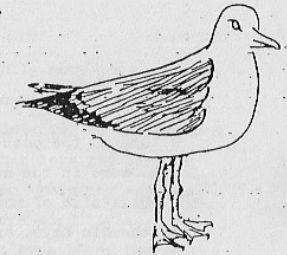
Of over 40 species, the Herring Gull, with white belly and black tipped grey wings, is the most familiar, commonly called the sea gull. The gull lives a very social life. A social life where the old birds have status and newcomers have to work their way up (some may see a parallel with hang gliding club life).

Gulls keep the same mate year after year but for the yet unmated bird, the group into which it was born serves as a meeting and courting place. It is usually the female gull who makes the choice of partner.

To get food a Herring gull chick taps a red spot on the underside of his parents' beak. This usually causes the adult to regurgitate food. Once the chick has learned to knock for food, he must next learn to keep his neck in. A high head and a stretched neck constitute a status symbol, and it infuriates an adult to see a presumptuous juvenile sticking his neck out.

Much of a gull's time is spent in preening its feathers, running his beak down the shafts of each feather to lock the barbs. Preening not only keeps a gull afloat, it also keeps him aloft. With a light skeleton of hollow bones—about one seventh of the bird's weight—and a wing span of more than four feet, the gull is airborne almost the moment it lifts its wings. To perfect its take-off it preens the top wing covers into a smooth frictionless airfoil. All this accounts in part for its success on wings. A gull can fly 35 to 50 miles an hour, and travel over 700 miles in 24 hours.

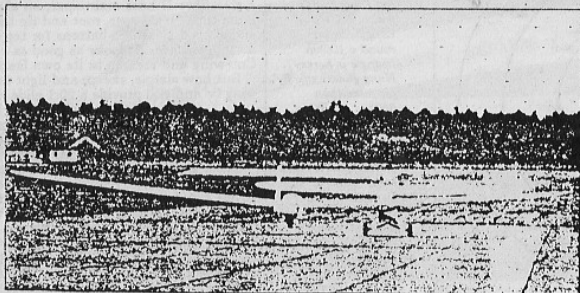
A gull will often be seen standing contemplating his feet—an activity peculiar to the breed. (another similarity with h.g. pilots on windless days !)



Gulls are very interesting birds to watch. On one occasion I observed a gull making the best possible use of an 18 mph wind. Taking-off from the beach into wind the gull when it had reached about 20 ft. ATO, dropped the article it had been holding in its beak. As the shell fell to the ground, so the gull would allow itself to be blown back by the wind in a beautifully controlled arc, diving down to the beach, making a perfect spot-landing, to pick up the unbroken shell and going through the same routine several times before it had succeeded in breaking the shell and could enjoy lunch.

We have all seen gulls circling up to cloudbase under a cumulus speckled sky. But I remember one October, the sky was completely covered by Stratus cloud. Several gulls were flying along the beach at Herne Bay downs in a light 5 mph WNW breeze. A sudden increase in wind strength to perhaps 10 mph, and veering North. One gull let out a squawk and made a wide 360 to bring it back into wind just above the 90 ft. ridge, it held this position facing into wind for a few seconds, then continued to circle up to about 500 ft. above the ridge. At this height it had drifted about 200 ft. behind the hill. The time was 4.00pm. The sky was covered by cloud, and now having reached the top of the lift the gull continued to glide on its way. I noted that the wind had reverted to its previous 5 mph. WNW breeze !!

Birds can be helpful, when you keep in mind the fact that all birds take-off and land into wind. No matter what direction a bird is flying, it will automatically turn into wind to land. If you observe gulls at rest, almost always it is facing into wind, ready for a quick take-off. When you land your hang glider, quite often you disturb birds and they fly off. If you are observant at this time, you will know if you are landing into wind or not, as you should be flying in the same direction as those birds that are taking off. Remember, birdwatching can be to your advantage.



Sampling the Future

by Garry Hume

One of the most irritating and frustrating aspects of flying the South Downs is the number of great flying days wasted, mostly due to the small size of most of our sites and the dreaded sea breeze. On light wind thermic days, only NE through to W winds can be contemplated - but even then, a lot of luck and skill is needed to get away. Normally you only get one shot before the sea breeze arrives and you end up unhappily de-rigging at the bottom with maybe a dozen other flyers, whilst one or perhaps two pilots such as John Pendry, Michael Carnet etc. somehow get away.

To this end I found myself travelling at 6 am through incredibly heavy rain and wind (well, the forecast said it would be sunny and calm) towards Norfolk to learn the art of towing at Tony and Ronna Webb's Tow School. My imagination had been fired by reading various articles on towing, and glowing reports from people such as Simon Murphy. The weather gods smiled however, and on arrival at 9.30 am it was cloudy but dry, with an 8 mph WSW wind straight down the runway - perfect - Ian MacGaskill wasn't a f.... b.... idiot after all.

I watched a local 'ace' tow up on a fixed line - it looked very smooth, serene and exhilarating - he released two minutes later at 1200' ATO. There were four other pilots all booked for the conversion course, from as far afield as Devon, the South Coast and the Midlands, plus several others training to become winchmen.

Our initial training was to be done on the school's Polaris, complete with training wheels, nose and wing tip rubbers - had they heard of my infamous landing technique? First flights were on a short 50' line, with three people at the other end running like hell to gently tow you up three to five feet above the runway. My turn came soon and off we went - only old ingrained reflexes showed - I subconsciously pulled the bar in and started to outrun my towing team much to their disgust. Breathless, Tony Webb firmly explained what I was doing wrong; and to get it right next time before I finished off the towing team with terminal exhaustion.

cont'd

Sampling the Future - by Garry Hume - cont'd

To take off you have to ease the bar out slightly more than normal and run slightly slower than the tow to maintain tension and therefore control - it felt weird, but stable. I was then connected to the payout winch (a large drum of line mounted on a trailer that lets the line be pulled out at a preset pressure as you are towed up. This compensates for gusts, pilot error, thermals etc). Pressures are very light, 45 - 50 lbs training, 80 lbs later - much less than even 1G of force which would be approx. 190 lbs. Very gently I was towed up to 10' ATO, then the car carefully slowed and I landed with the line still attached. Then over four more tows I learned how to release, when to go prone, reaching 600' ATO on my last tow. Unfortunately, I 'pinged' off the line at full tension and gained my second reprimand - does this boy ever learn?

My first big tow came next, vario-chirping at a steady 4 up, releasing at 950' ATO into gently bubbling air. The sink rate of the Polaris was much too high for the light lift (good excuse to cover my lack of skill) and I soon arrived back over takeoff at about 150'. My vario blipped 0 - ½ up, and I instinctively started circling, drifting over the airfield boundary much to my instructor's consternation. Deciding the lift was not really worth working I pulled on speed to return and found out how well the Polaris penetrates - or rather doesn't. I made it back to the airfield only 100 yds short of takeoff much to everyone's surprise - funny, I felt quite confident throughout.

Next came conversion to our own gliders - great, as the overcast sky was breaking up and small puffy cumulus were forming rapidly. I was warned that the Magic III was very yaw sensitive if flown too fast, or if even slightly overcontrolled. It certainly was, but I was soon releasing 1100' ATO and went off in search of good air. Instead I found nothing but sink, 4 - 6 down all the way to the ground. "I thought you were flying a Magic, not a flying brick," said one flyer. Tony was very impressed at my ability to core sink; my ego plummeted also at 4 - 6 down.

Next came learning to fly the fixed line system, less forgiving but much quicker turn round times and much cheaper - £75 for the fixed line compared to £1000 for the payout winch.

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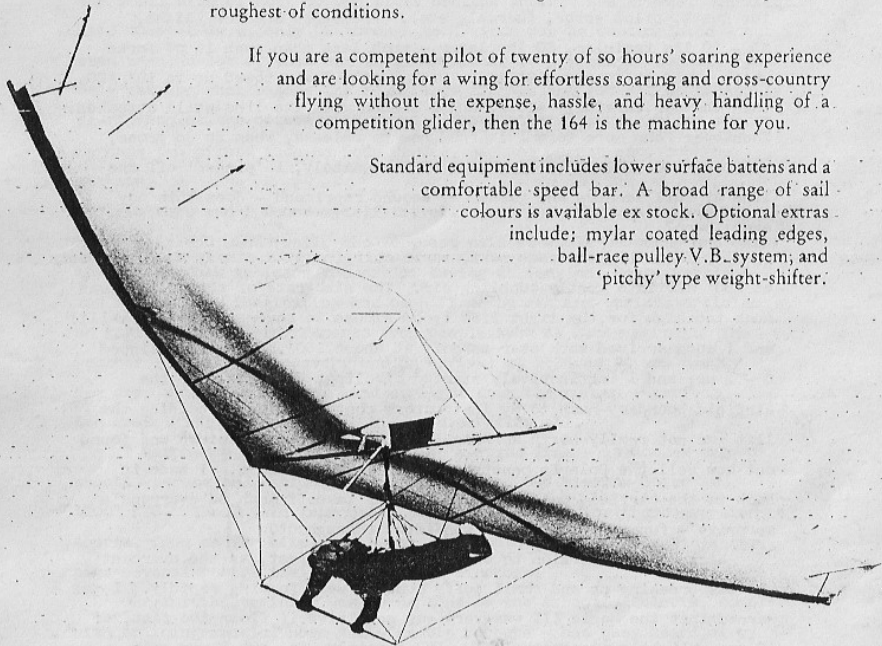
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Sampling the Future - by Garry Hume - cont'd

I was told to be gentle and not to push out too hard. Eager to launch again into a now brilliant, active looking sky, off I went, but at 400' ATO pulled on too much speed, and got into a series of violent yaws and broke the weak link, earning reprimand number three. I should add that I was the only pilot present inept enough to make all these mistakes. Then, with a textbook sky forming, the wind freshened, 10 mph with gusts to 20 mph at ground level and a very pronounced wind shear. Training stopped and the local aces continued towing.

At about 7.30 pm conditions mellowed and I had my final flight, again on the fixed line. I rehearsed the flight carefully in my mind - bar out, tight straps, remember the tilted earth phenomenon, don't fly too fast/over control. A smooth tow into a steady 14 mph breeze took me to 1000' ATO and I hung on to the line, relaxing, and taking in the fabulous view for the first time, painted below my by the yellowing sun, gold and green fields, the deep blue North Sea, the Wash in the distance, the dying clouds. My rapture was quickly interrupted - my driver had stopped, waved at me and disconnected my line - it was pointed out there were others waiting for their qualifying flights. Releasing the line, I floated in wide 360s over the sunlit concrete runway, where buoyant evening air kept my sink rate to only $\frac{1}{2}$ - 1 down, then finished with a perfect spot landing - at least I got something right.

To anyone who has ever considered towing before (and I never had until recently because of its dangerous past with dangerous methods and no safe training) I would recommend Tony Webb's method of skytowing.

As for myself, I am a below average pilot, (mainly because I work a 6 $\frac{1}{2}$ day week and get virtually no time to go flying) slowish to learn and very cautious by nature but I felt totally confident learning with the acknowledged experts in this country. My main hope now is that enough Southern Club pilots become interested in towing so that all those wonderful thermic nil wind days that we miss using without decent launch sites, can finally be used.

Finally, another aspect of towing became apparent on my days training. It is a much more sociable activity, with wives, girlfriends, parents etc, turning up to watch, help tow, or even have a go themselves.

cont'd

Sampling the Future - by Garry Hume - cont'd

I was so enthusiastic about towing that I booked to go again a week later. As I write this the forecast is giving ESE light, hot, sunny, unstable air - my first XC - perhaps Norfolk to Wales. Highly unlikely but I am an eternal optimist - I have to be, as I spend more time climbing back up the Dyke that I do flying above it!

If any P1's like myself (or better) with about 20 + hours under their belt fancy towing, contact Tony Webb at

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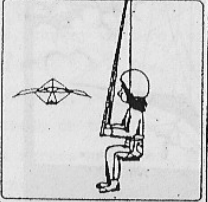
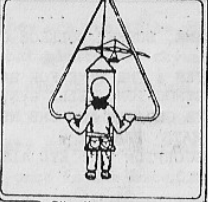
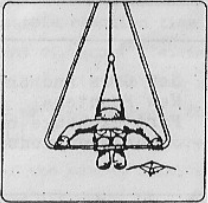

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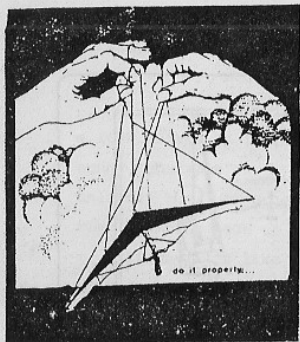
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<p>The Rules of The Air</p>		 <p>3 Situation - Both gliders approaching head-on and in danger of collision. Remedy - Both gliders must diverge to their right.</p>
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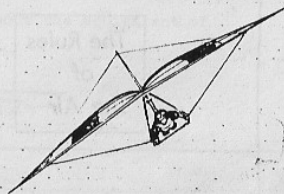
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CENTERING FLIGHT IN THERMALS

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The best thermal fliers in the world are not human. They are found amongst the soaring birds of the world: the buzzard, turkey vulture, eagle, pelican, osprey, hawk, stork, seagull, swift and swallow, to name but a few. Of all these, the masters of thermal flight are the swifts and swallows, particularly the swift which spends the first three years of its life entirely on the wing. If you spot these birds flying nearby as you struggle in broken zeroes and ones, try heading for them as they will almost certainly be centered on the best part of the lift locally.

On the other hand, if they are already with you and then disappear, it's not because they don't like you, rather that they have detected better lift elsewhere.

These brilliant birds hardly ever fly the same circle twice in a thermal presumably because the thermal air is rarely consistent enough for them, or else they are simply on the look-out for the biggest and juiciest insects to eat. Often it is impossible to know what they are doing, but they are fun to be with in the sky.

Whether it is a particularly warm parcel of air that blasts you skywards, or whether it is thermal air mixing with its surrounding air that lets you down, is sometimes hard to tell. Horizontal air movements only complicate your reasoning.

Centering, therefore, is something that is necessary during the greater part of a climb, as the thermal that requires centering only once is the exception rather than the rule.

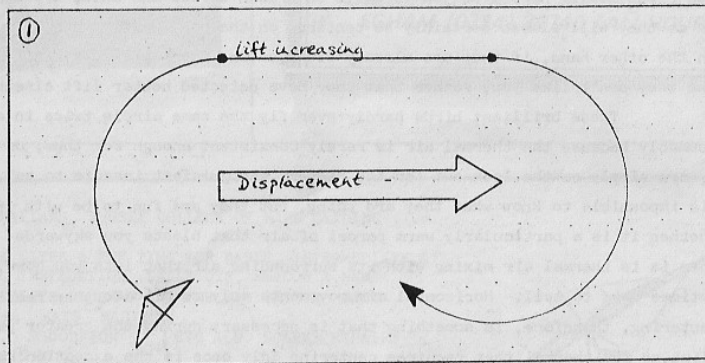
Learning to use your own senses of acceleration, as well as the sound of changing airspeed, to work out whether you are flying towards better climb conditions, is invaluable. 'Seat-of-the-pants' feeling (or 'seat-of-the-chest', for us hang glider pilots) for accelerations is very important since it allows the fastest possible reaction time to changing conditions. The best variometer with a time constant of zero (i.e. immediate climb indication with no delay) won't show any indication until the hang glider has actually begun to gain height. Fractions of a second earlier however, the human central nervous system has perceived the acceleration, and hence the presence of lift. As soon as you can determine the direction of the better climb area, you can note it relative to some feature, the sun, a ground reference, a cloud even. Of course, if you have a gut feeling for where the lift is, follow that intuition. If the outer wing is lifted, then there is good reason to suspect better lift on that side. You can either choose to reverse your turn to break into the lift on that side, or continue around as you are with a greater risk of losing track of the good air. The point is, you should react quickly whilst your picture of the lift pattern is still fresh in your mind.

(continued)

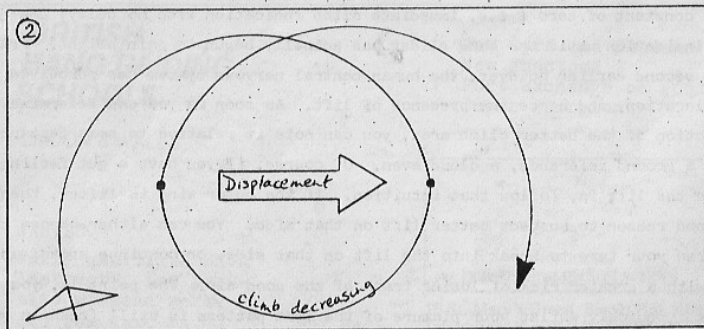
Centering Flight in Thermals (cont)

Centering methods:

Once you know which direction to go, don't be too concerned about performance losses caused by fairly high bank angles or the higher speeds needed to initiate roll reversals on those strong days. Be aware that the old fashioned method of centering, that is, levelling out in lift, flying straight for a few seconds and then starting to circle again (method 1), is not as certain to hit lift as other methods.



A method developed by Heinz Hirth, a German sailplane pilot and twice World Champion, works well on hang gliders as I discovered by chance when learning to fly thermals without a vario. It is also a very exciting way to fly: as soon as the lift becomes weaker, fly a half circle as tightly as possible until the lift begins to increase, then resume normal bank angle. In practice with-

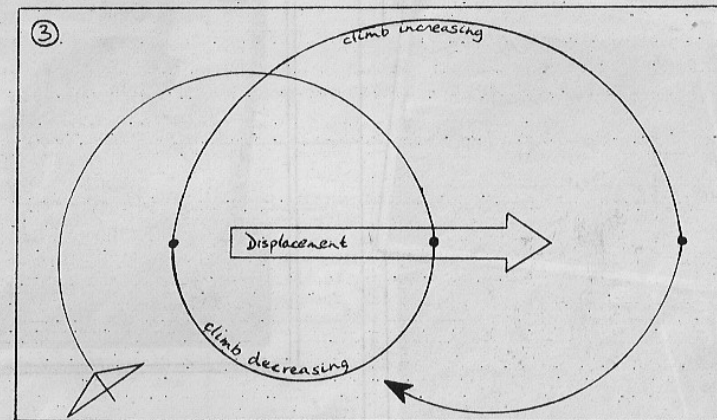


out a vario you can quite easily feel when the lift decreases, as the glider feels heavier and less buoyant with a pitch down, ranging from small to the 'over the falls'

Centering Flight in Thermals (continued)

feeling in strong conditions. Initiate as tight a turn as your airspeed will allow and more often than not you will soon feel the glider surging upwards again - a great feeling in a steep turn. Then flatten the turn to what it was before and bingo! you are back in the lift - usually.

To displace the circle with a minimum loss of time and with the best chance of finding better lift, another method exists which combines features of both preceding methods. It too is based on changes in rate of climb rather than on actual climb rate: as climb improves, flatten the circle; as climb decreases, steepen the circle. If the climb is constant, keep your bank angle constant. (method 3).



These methods are intended as a general guide only, due to the inconsistency of thermal conditions. Ultimately the ability to visualize thermals spatially, whether consciously or not, is of paramount importance. Of course, clean and co-ordinated flying is also required to thermal well, but it is more important to locate the thermal centre quickly; then you can fly your most polished performance yet. It is extremely useful to practise flying without a vario from time to time as this will force you to visualize spatially and make you less dependant on the vario which can then be used more usefully to confirm or deny your own feelings. In this way you will find yourself flying the air rather than the vario.

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(Source: Cross Country Soaring by Helmut Reichmann.)

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