

Further - Faster



How to improve your cross-country flying

Tim Barnes

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1. Introduction

“Those that can, do. Those that can’t, teach”

My credentials for writing this handbook aren’t great: the longest flight I have done is 400k and my best competition performance is 2nd place in a Regionals where most of the other competitors crashed. This is a collection of things I have learned, been taught or picked up over the years. I can’t claim to have mastered it all; my cross-country flying is still very much a work in progress.

I have shamelessly copied, plagiarised and cut and pasted from stuff other people have posted on the internet – there’s a lot out there and many good pilots have been generous in sharing their knowledge and experience.

2. Some general observations

Here are some things I have found to be true in my efforts to be a better cross-country pilot:

2.1 It’s not about the glider

My experience tells me that the factors that make a difference between the pilots that regularly do big tasks and guys like me that bumble around are:

- | | |
|-----|--|
| 15% | The glider and other whizzy bits of technology |
| 15% | Technique, e.g. being able to thermal well and handle the glider |
| 70% | Mental i.e. decision-making, attitude, persistence and balls |

So it’s all in the head.

2.2 You have to push yourself

If you want to make progress in cross-country flying you have to push yourself – nobody else will.

Pushing yourself means

- going somewhere you haven’t been before;
- being ambitious and setting bigger tasks;
- flying cross-country on less than ideal days;
- pushing on into indifferent weather.
- take some risks, like heading off towards a cloud even though you are not sure you can reach it or going on cross country on less than ideal days and

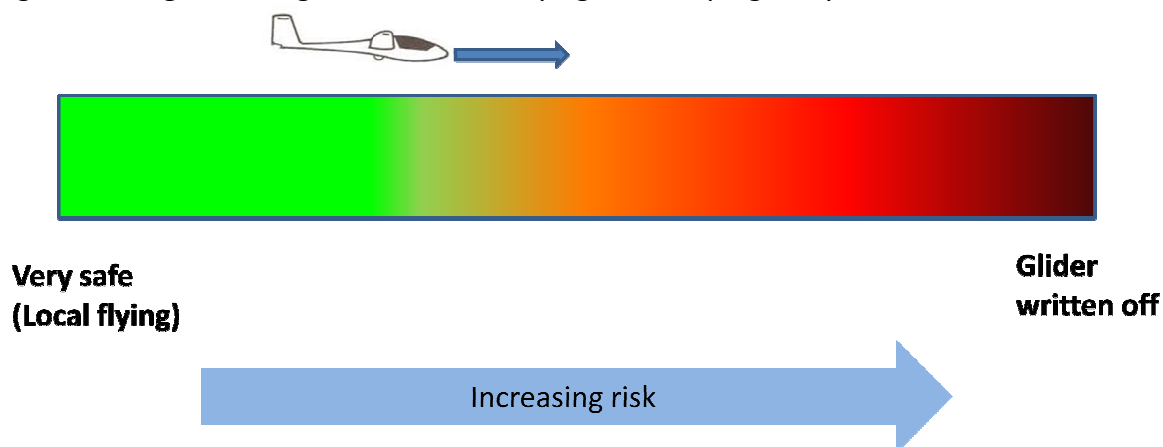
Only by pushing it a bit can you develop your skills and learn just what you and your glider are capable of. And if you do push it a bit you’ll learn your glider will go further than you imagined and you can stay up in very unpromising conditions.

“The most important thing is to have an ambition to go further and be optimistic about the possibilities. The modern glider is an incredibly efficient machine, but its capabilities are often limited by the ambitions of the pilot. It is only by attempting to fly further/faster than our previous efforts that we can come close to discovering the full potential of both.”

Doug Gardner

2.3 About risk

Gliding is an adventure sport and we operate on a spectrum of risk. At one end is local soaring where there is very little risk of a land out or anything unpleasant. At the other is high-risk marginal final glides, mountain flying and scraping away from 500'



To do well in cross-country flying you have to be prepared to take on some risk, i.e. operating in the orange while avoiding ending up in the red. You can do this reasonably safely by gradually pushing your boundaries.

A good indicator is the number of times you land out in a season. If you don't land out at all, you are not pushing yourself enough. If you land out 3-4 times in a season, you probably have it about right.

2.4 Things that definitely help

- Flying as much as possible – there is no substitute for being current and accumulating experience.
- Being able to fly mid-week (sorry wage slaves).
- Reducing the mental workload. You need to be free to concentrate your processing power on decision making, so anything that reduces the mental work load in flight helps, e.g. making sure all your instruments work, programming your GPS/SatNav, having airfield radio frequencies to hand, folding your map well.
- Setting a task each time you go cross-country, rather than just wandering around.
- Hanging on the coat tails of better pilots, i.e. setting off on the same task as them, listening how they plan their tasks.
- Getting on site early on the good days.
- Going on a Nympsfield cross-country course (Cost £120 + launch fees)
- Flying a competition.
- BGA ladder – looking at what other people did on the day and how they did it (If you don't have SeeYou, IGC Flight Replay is free software for viewing IGC files)

2.5 Things that hold you back

Fear of field landings

I think some pilots are put off by the prospect of field landing, i.e. the fear of whether they can find a field and then safely land in it. As someone who does more than his fair share of field landings my advice is:

“The first thing to say is that if you fly cross-country and stretch yourself like you should, you WILL landout.”

Paul Friche, Nationals pilot and X-C coach.

- pick your field early;
- relax and enjoy it – nobody likes landing out, but once you are down it is not an unpleasant experience and part of the adventure of gliding;
- give yourself a pat on the back – landing in a field is one of the most skilful things we do as pilots;
- when you are old and grey, you’ll remember your field landings more than the flights when you got back.

Not having a retrieve organised

It’s best to have a retrieve sorted out before you leave – not having one makes you fly too conservatively - but it’s not essential. Don’t let it stop you flying cross-country, somebody will always come and get you, especially if you have done a few retrieves yourself.

Not having an effective pee system

This is a must - it’s really difficult to fly well or make good decisions when you are bursting for the loo. I lost the best part of half a season and spent an uncomfortable two hours in a puddle of pee through not having a decent system. For men, the BGA sheath is the best solution I have come across.

Domestic commitments

Anyone who has a spouse that isn’t a glider pilot will know what I am talking about here.

Lack of balls (courage)

This comes back to being prepared to take risks. You just have to grow a pair (I’m not quite sure what the ladies are supposed to do).

3. The secret of going further and faster

Here's the best quote I have come across that explains what flying further and faster is all about:

"It's like a running race, only it's a race where every so often we have to sit down and just wait for a while (thermalling.) So, in this case, the race isn't won by the runner that runs the fastest, but the one that spends the least time sitting down"

Chris Rollings also puts it well:

"Good cross-country pilots hate thermalling"

So, the secret to going further-faster is to

spend less time thermalling.

To spend less time thermalling we need to:

- choose our route to make the best use of the energy, so we don't have to circle;
- find and use only the strongest thermals;
- centre in the best bits of lift quickly;
- avoid messing about in weak lift (unless we have to).

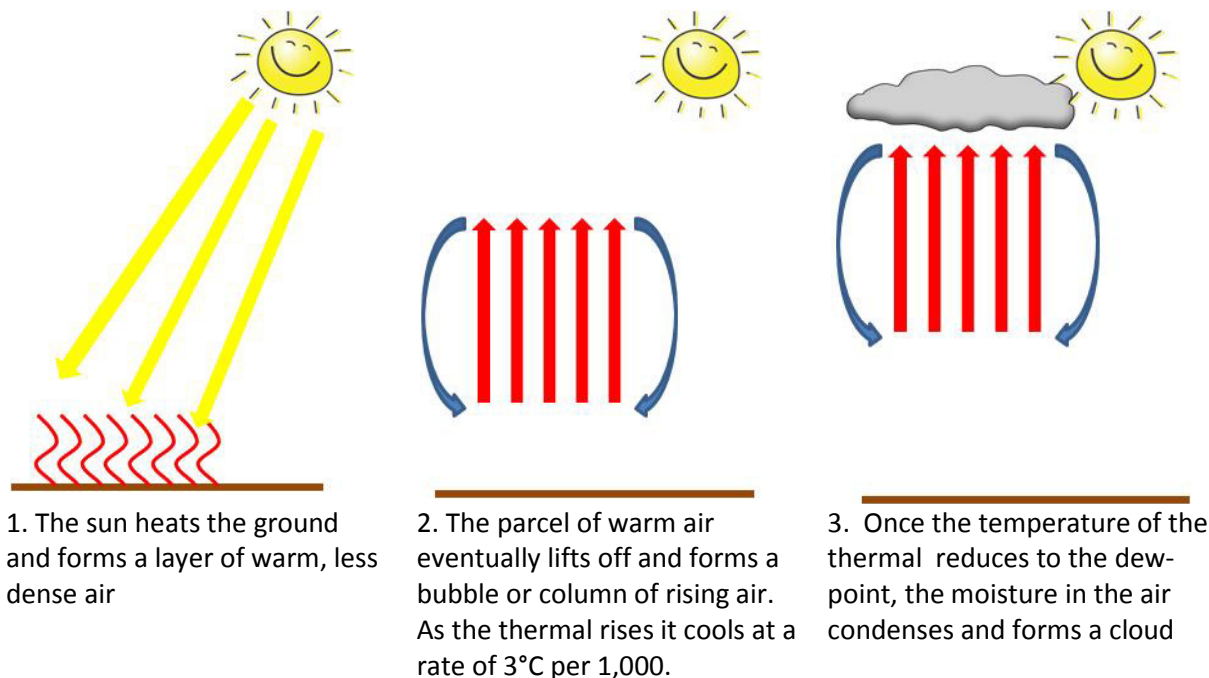
That's all there is to it!

Key point 1 The secret is to spend less time thermalling

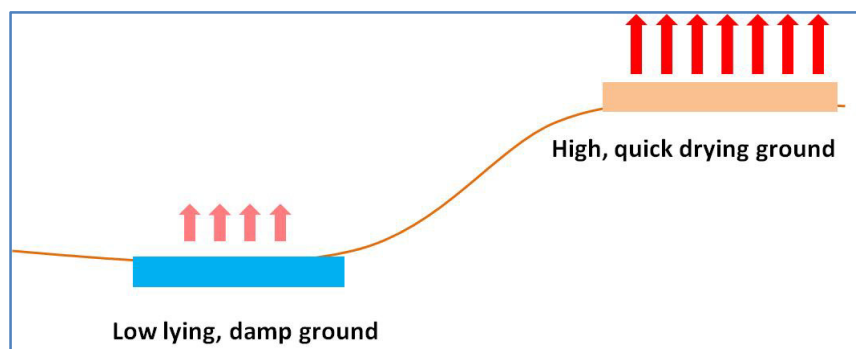
4. All about thermals

4.1 How thermals form

If you a reading this you will already know how thermals form, but let's do a quick recap:



A key point to bear in mind is that thermals form much more readily on quick-drying high ground than on low-lying damp ground. So, you'll do better, particularly early in the day, flying over high ground (like the Cotswolds).



Key point 2 Thermals form much more readily on dry high ground than on soggy low ground – fly over the high ground.

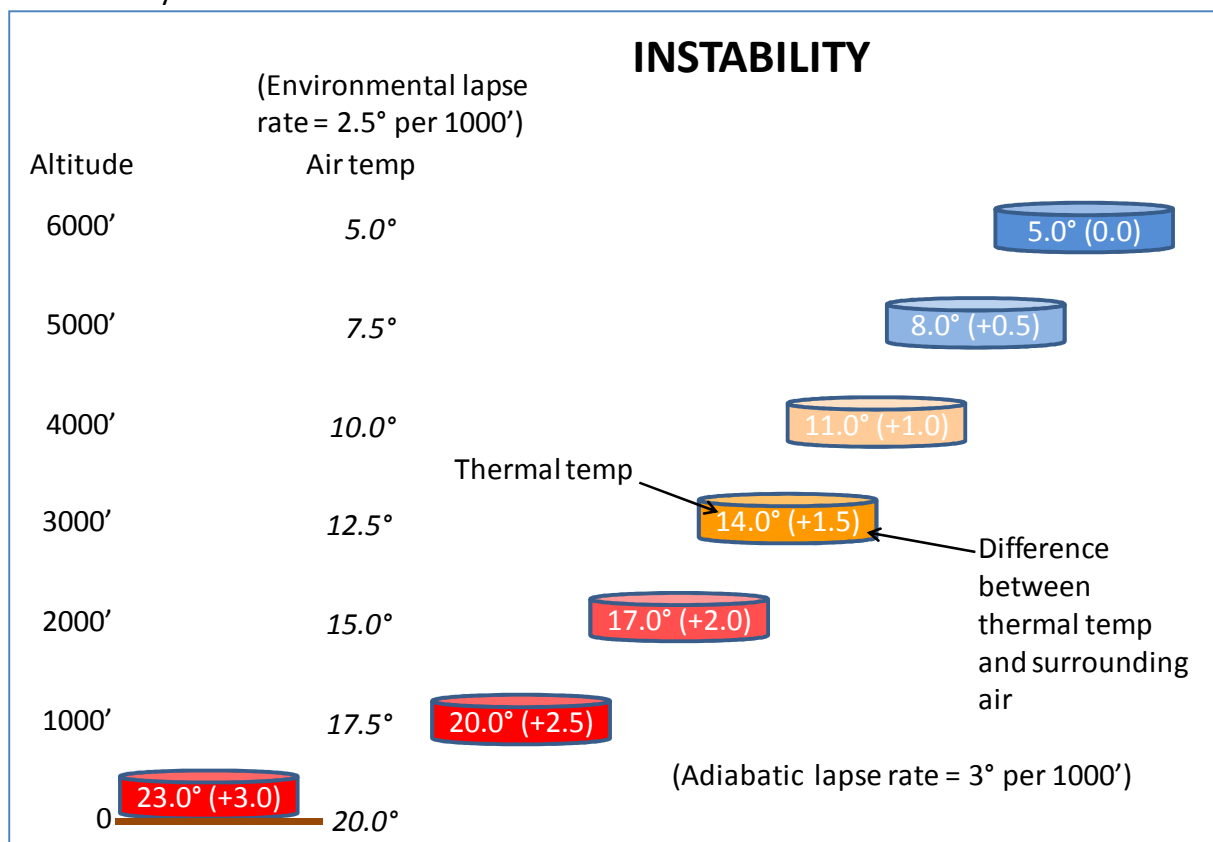
4.2 Stability/instability

The strength or buoyancy of a thermal is governed by how much warmer and consequently less dense thermal is compared to the surrounding air – as long as the thermal is warmer than the surrounding air it will carry on rising. As the thermal rises and the air inside expands due to reducing pressure, it cools by 3°C per 1,000' – the adiabatic lapse rate.

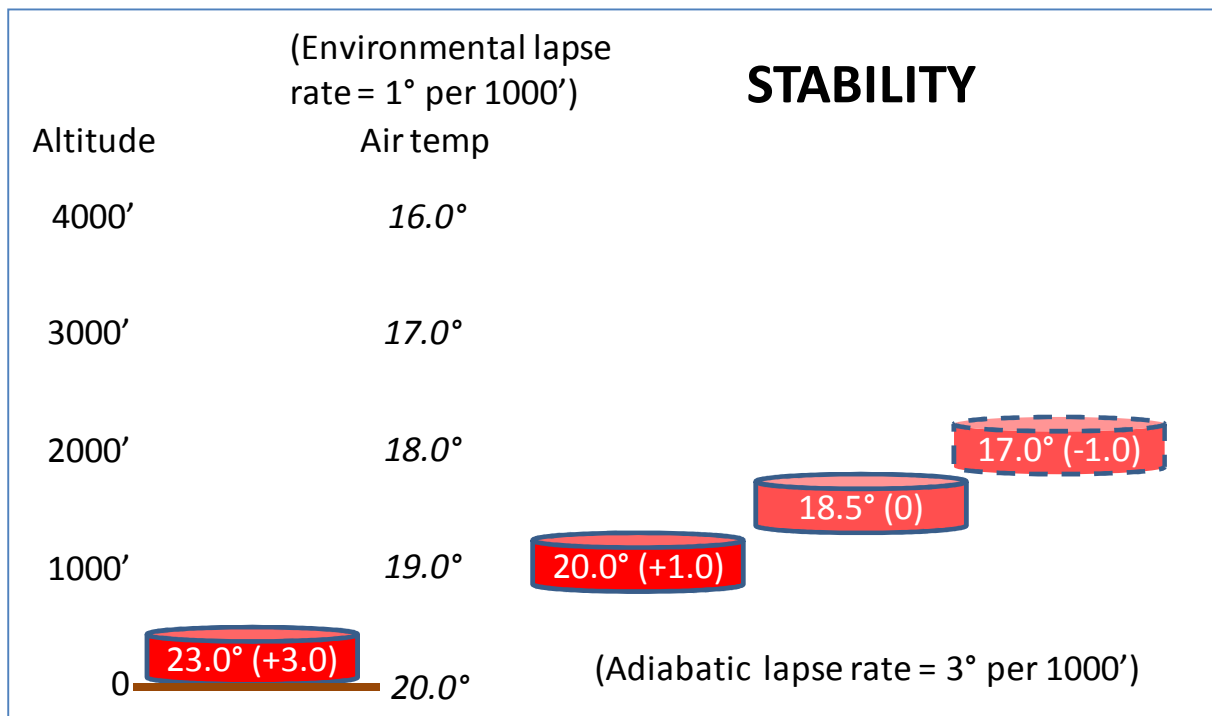
When the temperature of thermal reaches that of the surrounding air it will stop rising. However, the surrounding air also has a temperature gradient (the environmental lapse rate), i.e. it too reduces with altitude. How fast it reduces will effect the strength and depth of convection. In general, a thermals are stronger and the convection deeper when the adiabatic lapse rate is higher

If the temperature of the surrounding air drops relatively rapidly with altitude, it will take longer for the thermal temperature to reduce to that of the surrounding air. This is known as unstable air and gives stronger, higher thermals.

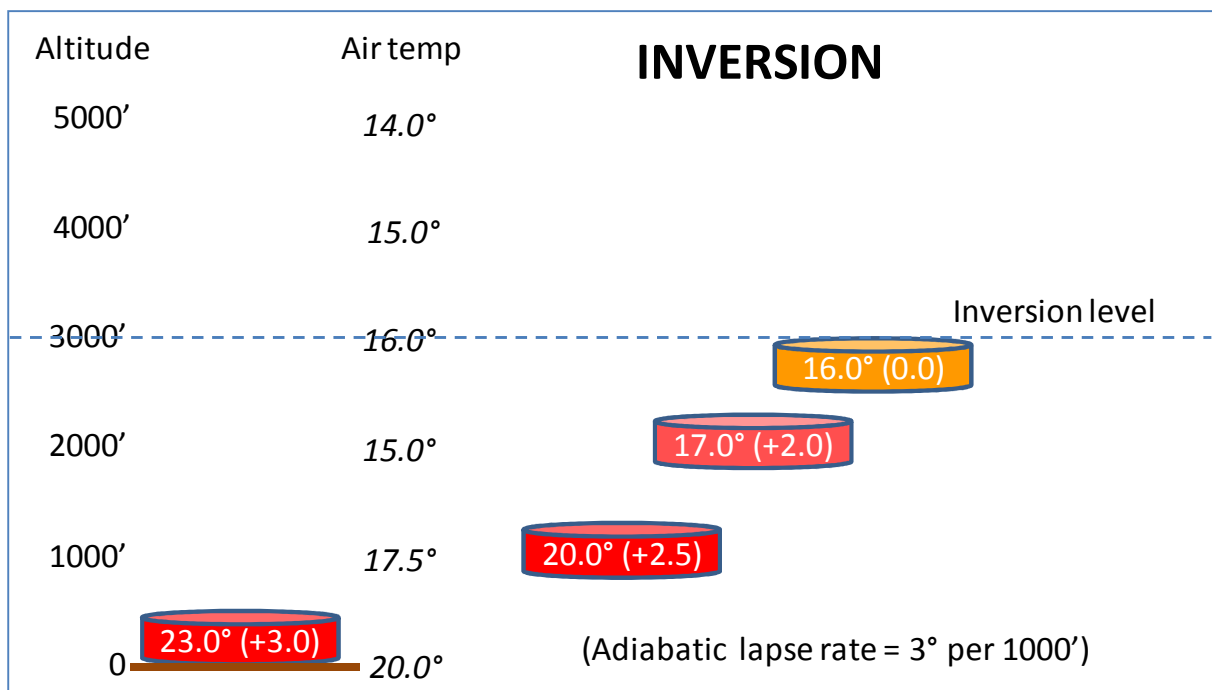
The diagram below shows the example of a parcel of air warmed to 23°C against a ground level temperature of 20°C. As it rises the thermal cools at the adiabatic lapse rate of 3.0°C/1000'. For the purposes of the example the environmental lapse rate is 2.5°C/1000'. i.e. relatively unstable air.



If the temperature of the surrounding air reduces slowly with altitude it won't take long for the thermal temperature to cool to the same temperature as the surrounding air. In the diagram below the environmental lapse rate is 1.0°C/1000' – relatively stable air



Another effect that reduces the height of thermals is an inversion, i.e. when air temperature first decreases with altitude then increases, i.e. where there is layer of warm air over a cold layer. The height where the temperature starts to increase effectively puts a cap on the thermals



4.3 Vertical profile of thermals

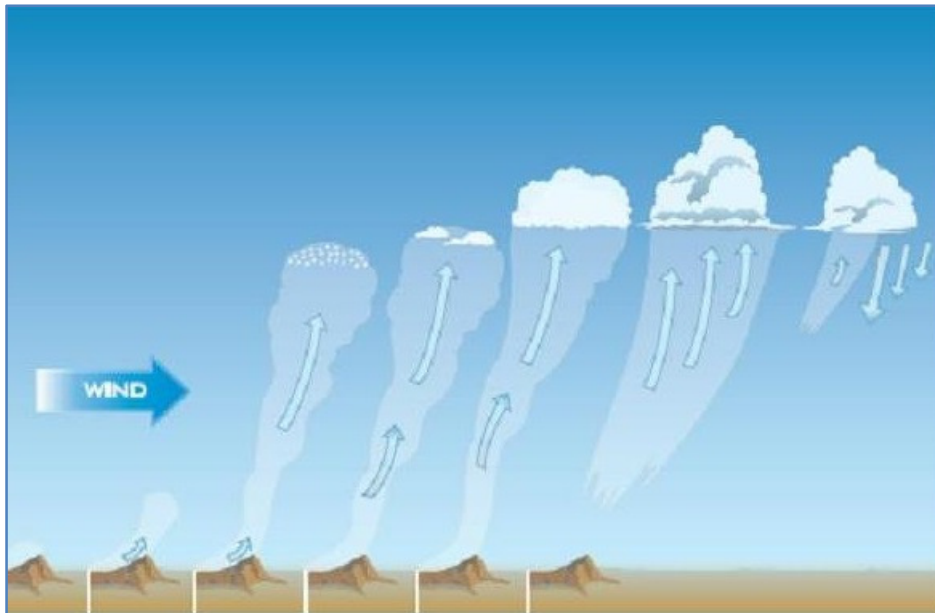


Here's the best photo I could find that shows the shape of a column (as opposed to a bubble) thermal. The important thing to note is how narrow the thermal is at the bottom – this is why you have to turn tighter lower down.

Key point 3 Thermals are narrower lower down (so you have to turn tighter)

4.4 Thermal lifecycle

Thermals are born, they live and they die.



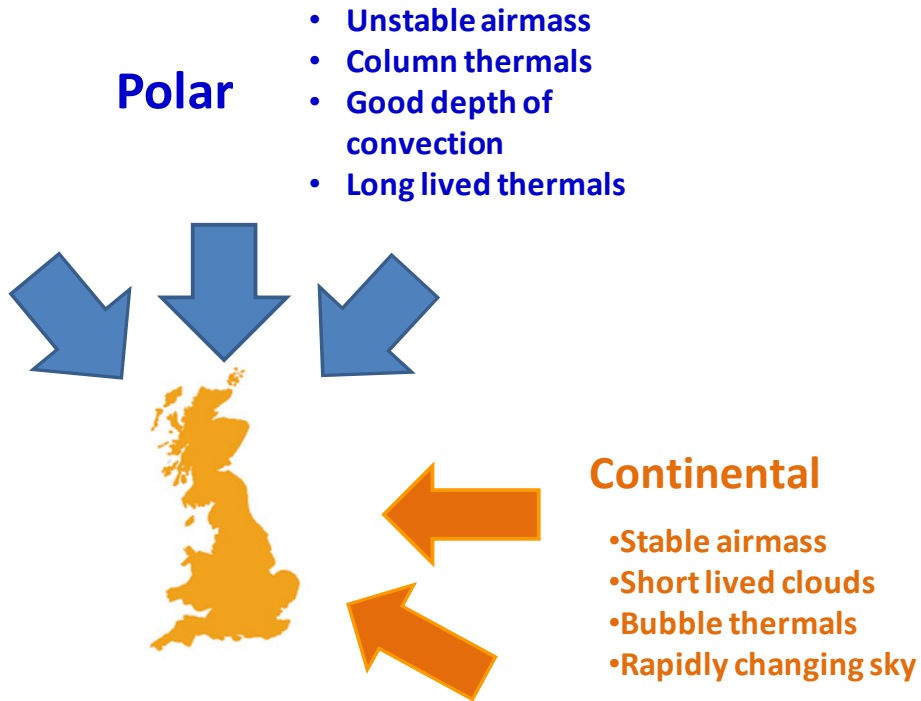
On a good day, the main stages will be:

- No cloud – the thermal has just been born, typically the lift is very broken
- Small wisps – better developed lift, but narrow core
- Developed cumulus – flat grey, bottom, strong, well-developed lift

- Decaying cumulus – indistinct broken bottom, soggy lift or sink

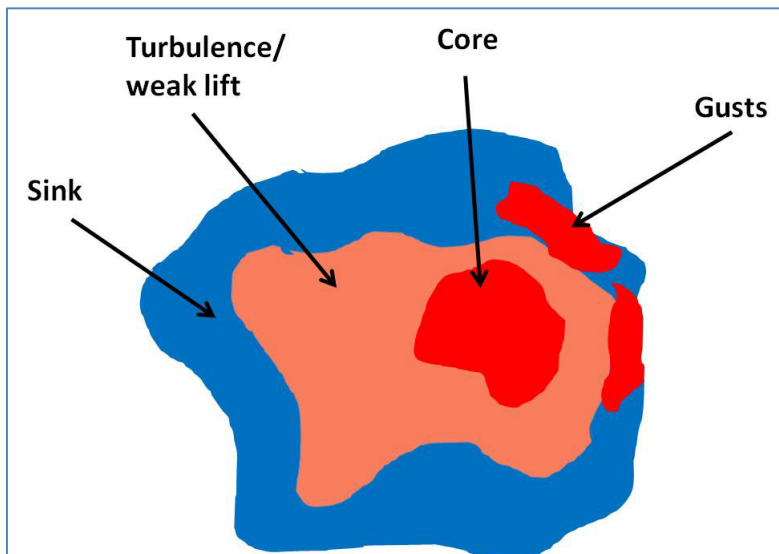
Lifetimes and amount of cloud vary widely with the time of day and conditions. Sometimes they are very short-lived shallow bubbles – two minutes late and you have missed it. Other times they have lifetimes of 40 minutes or longer.

To a certain extent, thermal characteristics depend on where the air is coming from:



4.5 Thermal shape

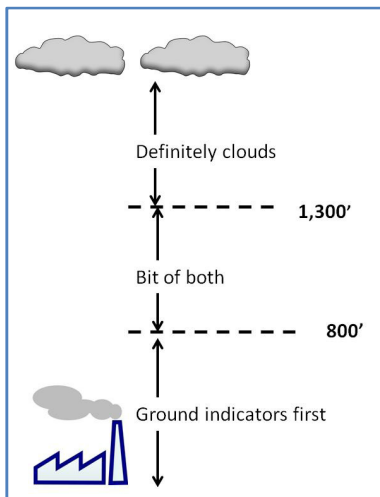
From the diagrams and pictures you might imagine that thermals are nice regular columns with a circle of sink on the outside and regular, circular core in the centre. While this might be true in the places like the US and Oz, it certainly isn't the case in the UK. The Great British Thermal is infuriatingly irregular and unpredictable. Although they are horribly irregular, for the most part thermals share some common components:



- Sink – just about all thermals have sink on the outside, so an increase in sink rate is often a good sign - something is going up somewhere.
- Areas of weak or turbulent lift known as “cobblestones”
- Gusts – small, narrow areas of strong lift, usually at the outer edges, that feel like the core but when you turn in them they immediately turn to sink.
- Core – the central area of lift is (hopefully) big enough to circle in, often off to one side.

5. How to find a thermal

5.1 Ground features or clouds?



When you are high use clouds, when you are low focus more (but not uniquely) on ground features.

Most of the time the focus is on clouds.

5.2 Cloud spotting – what to look for

Clouds that are working well have some or all of the following characteristics

- Grey, flat or concave bottom
- A deep grey bit
- Fluffy white top
- Good depth
- Building rather than decaying
- Steps or areas where part of the cloud is higher.



Early wisps. Probably working, but broken



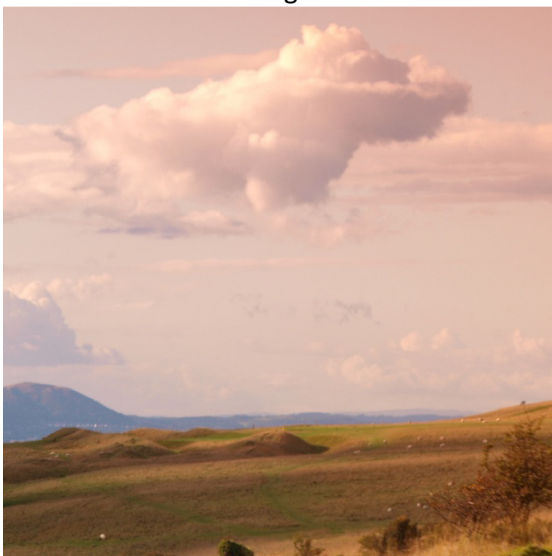
Developed cumulus



Nice grey flat bottom, decent depth – should be working well



Slightly concave bottom (even better), stronger peak on the right (likely to be working better)



Rubbish cloud (straggly bottom) – probably not working (but note the step feature)

5.3 The run in

Once you have picked your cloud, here is the typical sequence of events as you approach it:

Sign /stage	What to do
Approaching the cloud	Have a plan Look for darkest part – head for it Also look for steps, concave areas, tendrils and vertical peaks. Look out for other gliders
Sink	Speed up
Gusts	Slow down a bit Don't turn immediately – count to three Wait for a sustained vario reading
Cobblestones zero sink weak lift	Slow down (change flap setting) Keeping looking/heading for the darkest bit. Lighten up on the control (relax grip on stick) – get ready to feel the thermal. Shallow turns , S turns – looking for the core
Core	Feel it in your backside. Watch for string being deflected. Feel for which wing lifts– turn in that direction Don't turn immediately – wait until vario peaks. 40-45° angle of bank

On a good day, once convection is well establish, it is often the case that there is a consistent pattern to where the core is – sometimes it is on the on the sunny side of the cloud, sometimes the downwind side and sometimes the upwind

6. The thermal turn

Good, well controlled turning is at the heart of thermalling. Being able to turn tight enough and control your speed are critical.

Key points are:

- in general, thermal cores are narrow of the order of 100m;
- to stay in the core you need to fly small, tight circles;
- with 25° bank the diameter of your circle will be around 150m circle (too wide), whereas at 45°bank it will be 80m;
- the radius of the turn is governed by the angle of bank and your speed – the faster you go the wider your turn will be, so speed control is critical.

The thermalling turn:

- 40-45° of bank for a good core, sometimes you'll need more
- The right speed for your glider (as slow as possible why still retaining good control)

- Good speed control, aim for better than +/- 2kts Do it by attitude rather than chasing the ASI, i.e. get the speed right, note where the horizon is on the canopy and keep it nailed there.
- Keep the string straight.

"I went on a nine day x-c course at Nympsfield led by Chris Rollings. The weather wasn't kind to us and we only got two days flying. On one of the days I had a flight with Chris in the DG 500, scratching in weak, scrappy thermals off the Nympsfield ridge. It was ¾ hour of being ruthlessly nagged by Chris every time I went a knot over our target airspeed or allowed the string to go off centre. In terms of the impact it had on my flying, the course was worth it just for that flight."

Key point 4 Turn tightly (45°)

Key point 5 Get really good at controlling your speed in the turn

Mostly thermalling is about finesse, having a light touch on the controls and being able to feel the air. At other times it does require brute force – there have been time when I have needed two hands on the stick to get the glider to bank into a strong thermal.

"When it is smooth, fly smooth. When it is rough, fly rough"

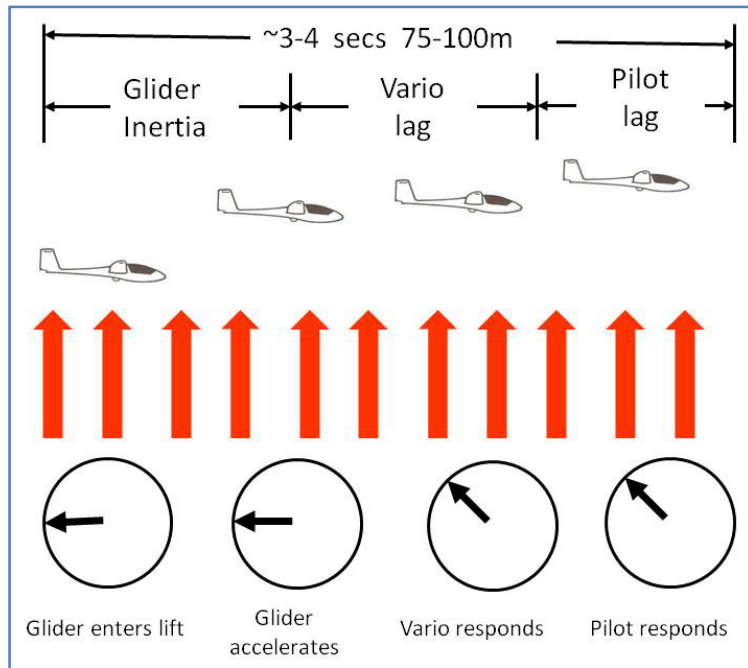
7. Thermal Centering

First the bad news: there is no magic bullet, no single centering method that will magically transform your thermalling. There are number of methods - some of which seem completely contradictory – and you have to try them all and find out what works for you.

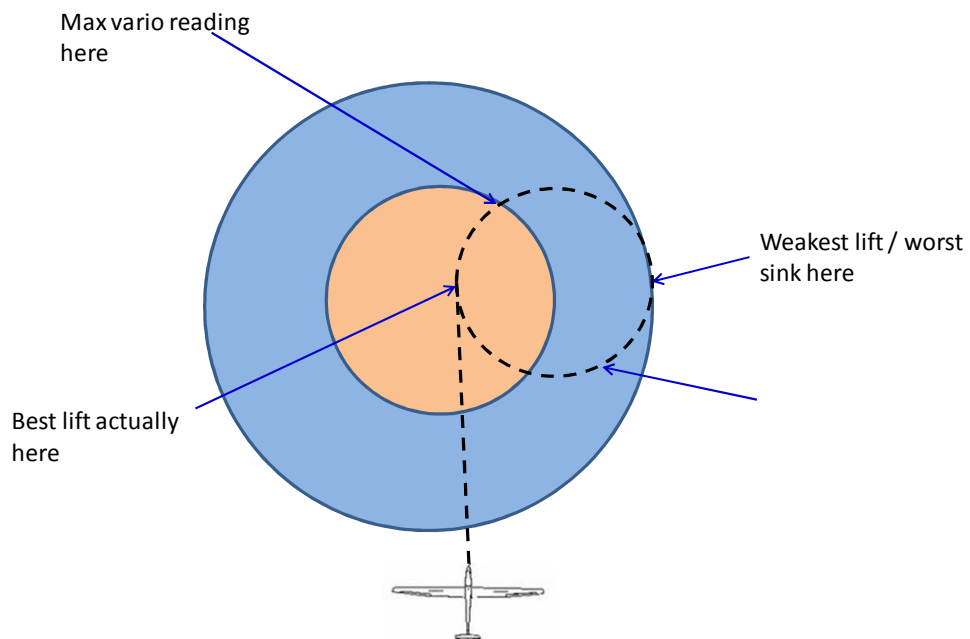
7.1 BGA Method

- **Fly a properly banked turn when variometer indicates maximum lift.**
- **Reduce angle of bank if/when less lift is indicated.**
- **Increase the bank again as lift improves.**

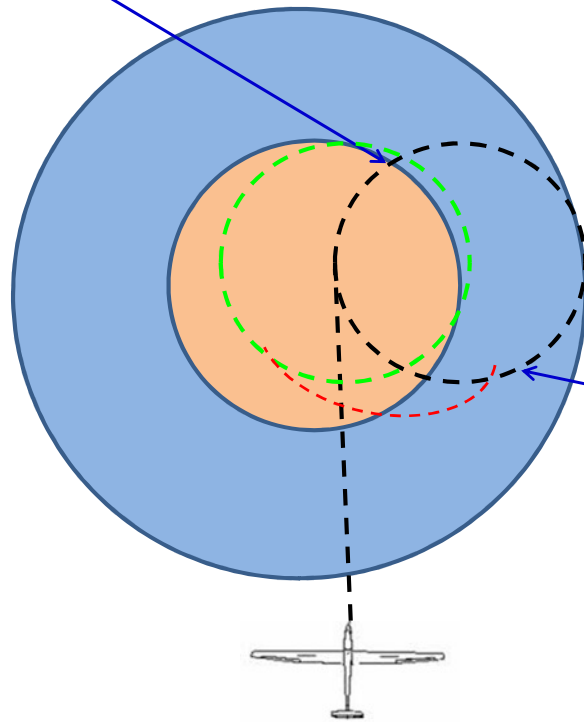
This method is based on the assumption that there is a 3 second or so lag between when the glider actually enters lift and when it is indicated on the vario. (3 seconds is roughly 60 degrees of a thermal turn).



Vario lag



Max vario reading here

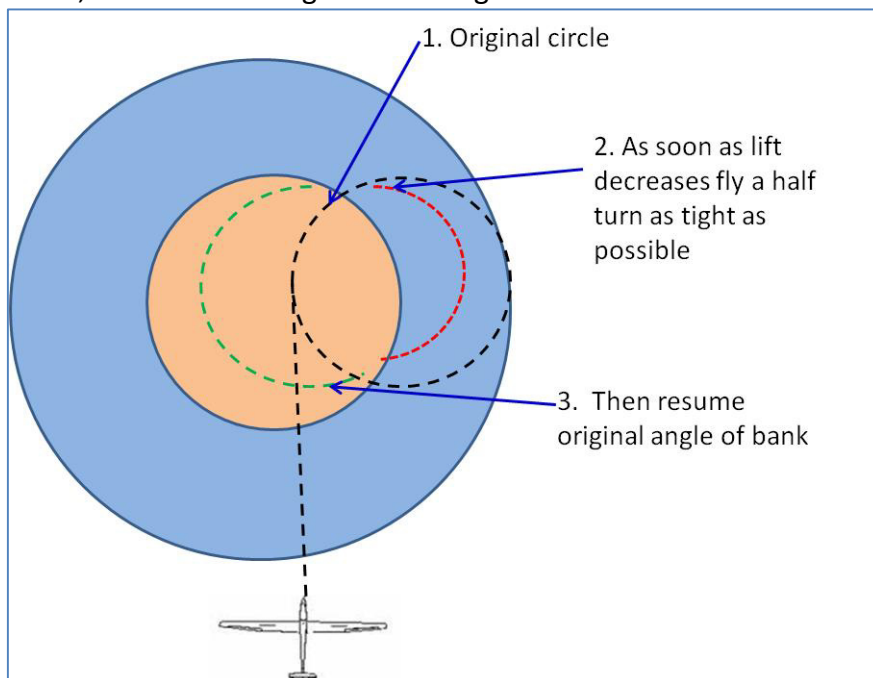


Weakest lift / worst sink here

Weakest lift indicated here

7.2 Heinz Huth (world champ)

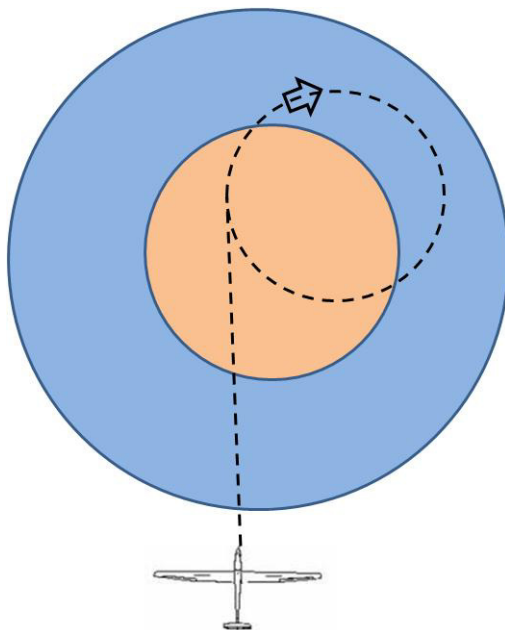
As soon as the lift becomes weaker fly a half circle as tight as possible (A-B) until climb rate begins to increase, then assume original bank angle



7.3 One, Two, Three method

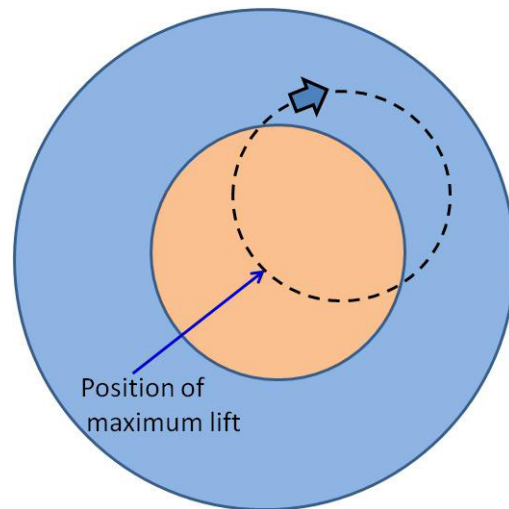
Video at <http://tinyurl.com/zen9dox>

Step 1



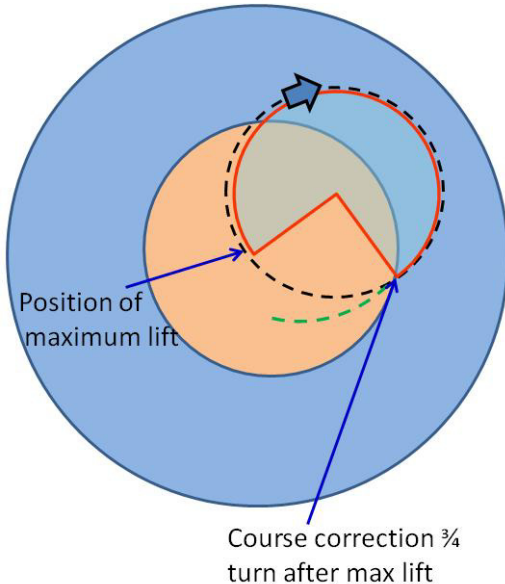
Do a well balance constant speed turn – check where the strongest lift is.

Step 2



Do at least two turns to confirm the position of maximum lift.

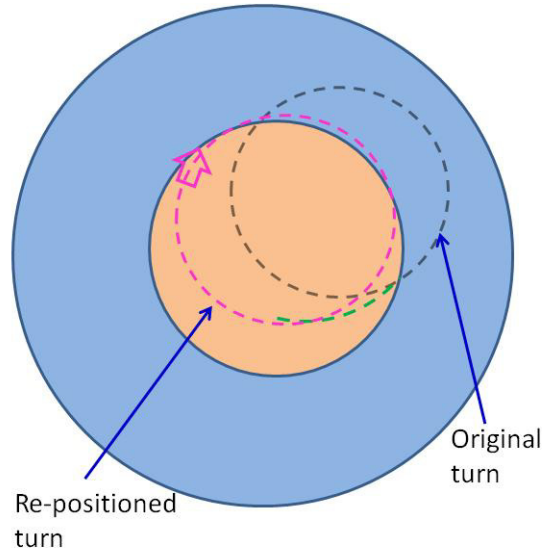
Step 3



Step 3

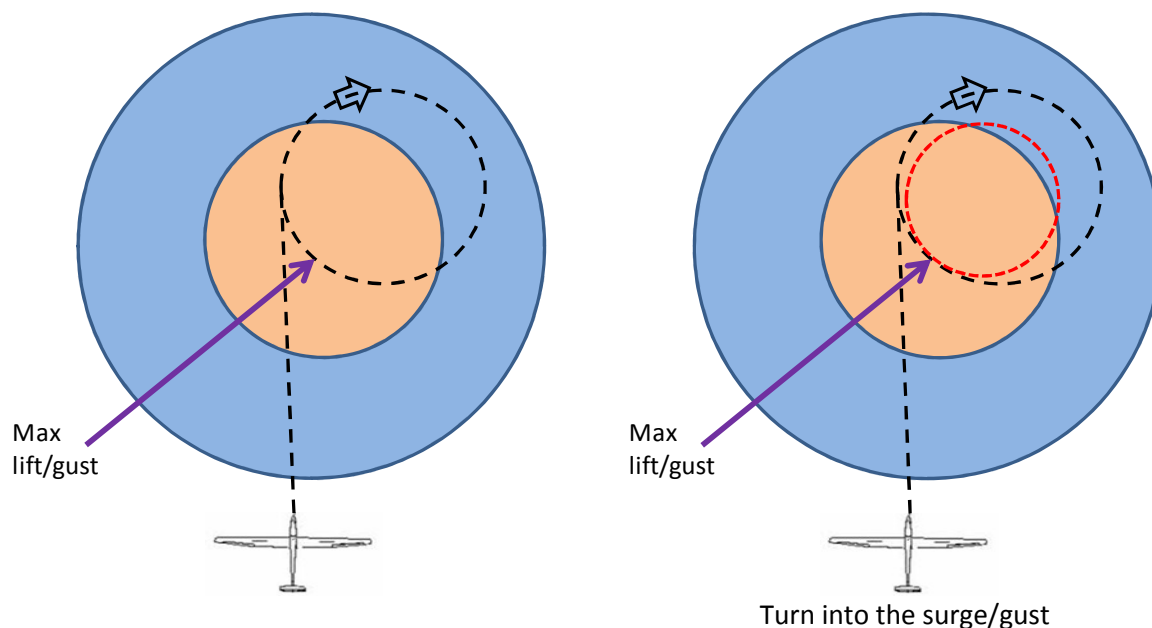
Three quarters of a turn after the position of strongest lift, make a correction - widen the turn by reducing the angle of bank or levelling the wings for a second.

Result



7.4 Turn in to the gust (Jay Rebbeck)

When the maximum lift is indicated/felt increase the angle of bank – dig into the gust.



7.5 Build up a mental picture

This is a question of building up a mental picture of the shape of the thermal, i.e. where the core is in relation to your circle and making small adjustments, e.g. reduce angle of bank or straighten up for a second 90° ahead of where you think the core is, to take the circle to the core. SeeYou thermal assist can help (if I can figure out how to use it)

"Reducing the angle of bank as you enter the sink will always lose the thermal."

Andy Davis

Key point 6 There is no single right way of centering – try them all and see what works.

8. Leaving the thermal

When the climb rate starts dropping off – it's time to go - see Andy Davis big question para. 11.3

Aim to accelerate in the lift, not the sink.

Quite likely you will go through a gust – pull up, but try not to be suckered into doing another turn

9. Blue days

Flying on blue days is like jumping in the sea – the idea is distinctly unappealing, but once you dive in it's not as bad as expected. The main thing is finding the courage to set out.

Tips are:

- Look for haze caps and wisps.

- Pay more attention to ground features (because there isn't much else to look for)
- If there is a bit of wind, look out for streeting, i.e. if you have caught a thermal, there may well be another one either up wind or down wind.
- Be optimistic – if there's a lot of sun getting to the ground, it must be producing some thermals, somewhere (unless it is really awful air)

Route	First Stab (approx 100k O/R)	Stretch your legs (200k O/R)
North-west	Tenbury Wells / Ludlow	Long-Mynd
North –East	Edgehill	Hus Bos
East	Enstone or Bicester	Northampton, Milton Keynes Grafham Water
South-East	Chieveley or Newbury	Alton
South	The Park	Sherbourne

Another “motorway” that it is well worth getting familiar with is the Newbury-Bicester route. This is a really important north-south link route and it helps a great deal if you are familiar with it. Flying round the Brize Norton airspace is a good introduction to this.

10.2 Spotting a good day

The following are all good, advance notice signs of a good day:

- Forecast northerly airflow
- a cold front going through either the evening or night before
- a cold, clear night
- high pressure building
- TV or radio forecasters talking about “cloud bubbling up”
- Lasham forecast – this is an email forecast that is only sent out when a day or series of days is looking good. You can sign up for the forecasts at <http://www.lashamweather.co.uk/forecasts.php>
- a good forecast on RASP
- posts on the Yahoo group warning of a good day.

10.3 Considerations for task setting

When you are deciding where to go, these are the factors you need to take into account:

Wind direction – go down wind first

In general, it is easier if you go down wind first, when the thermals are not so good. You’ll then be doing the into wind leg when the thermals are strongest.

Wind strength

If the wind is 10 kts or stronger, there is a good chance it will be streeting, so a task that is broadly up and down the wind direction is going to be easier.

Airspace and NOTAMs

RASP info

There's a host of information available from RASP and other sites including:

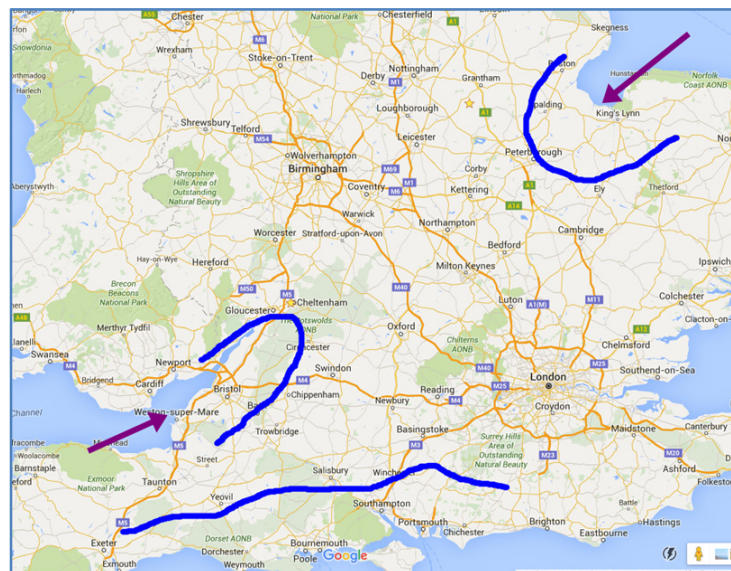
- Start and finish time for thermals
- Best areas of the country
- Predicted thermal strength
- Predicted cloud bases

Terrain

As mentioned earlier, thermals form much more readily over high, dry ground – the brown bits on the map. For the best thermals, choose routes that maximise your time over these areas, particularly early in the day. So, for example, setting out for the Long Mynd from Aston Down early in the day can be a little tricky because you have to cross the low lying, damp Severn valley. Whereas if you head north-east, say towards Hus Bos, the first 50km is mostly over high ground

Sea breeze fronts

In a south-westerly, anytime after midday, the area to the south and west of AD can be effected by sea air blown in from the Bristol Channel. This can make getting away from, and back into, AD difficult and tasks to the south tricky. Equally, in a north-easterly, tasks to the north-east of Northampton can be effected by sea air from The Wash.



11. Getting a wiggle on: in-flight decision-making to improve speed

“Judgement is what comes from making bad decisions”

11.1 Look ahead and make a plan



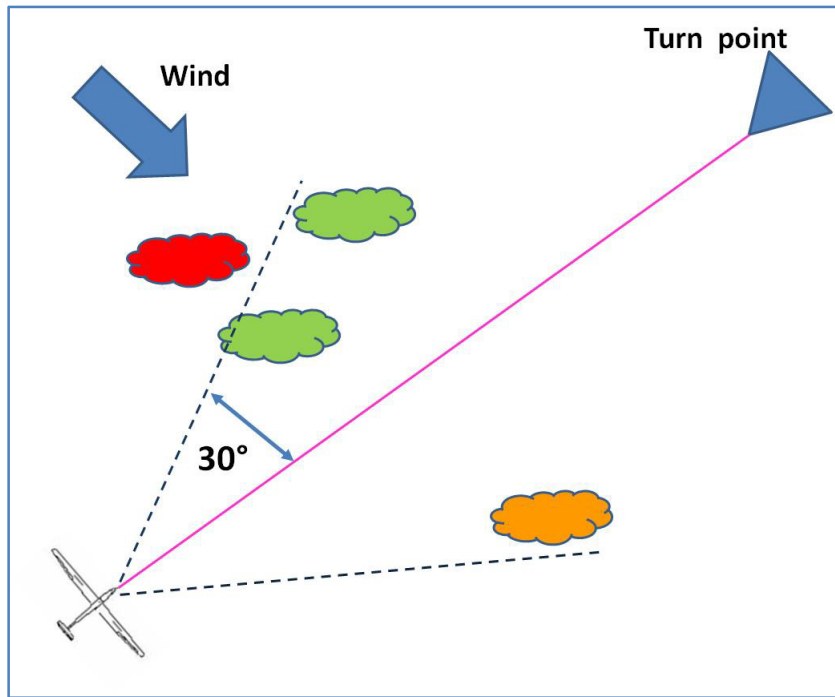
All the time I am flying I am looking around at the sky and planning on three levels:

- 1) What's the next cloud I'm going to go to?
- 2) What's it looking like further down track. Where are the next 2-3 climbs going to come from? Which energy line I am I going to try and follow? Can I carry on on-track or do I need to deviate a bit? Is there a blue hole coming up?
- 3) The big picture – What's the weather doing? Is it over developing? Is there top cover coming in? Is it going blue?

It's a question of looking as far ahead as you can and building up a game plan – something along the lines like *“I'm going to go to that cloud over there, if it doesn't work I'll try the one just beyond it, and then I'm going try that street over there, then I'm going to try and get as high as can to cross that blue gap that's opening up”*. Then keep re-appraising the plan as you progress and conditions change.

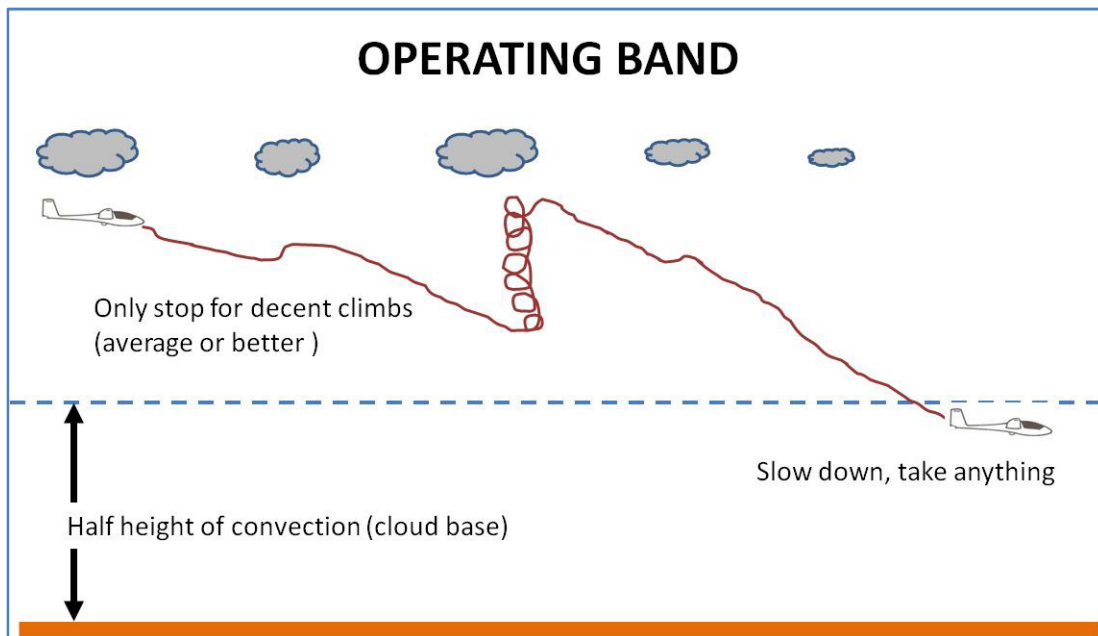
It's OK to deviate off track by up to 30 degrees to get to a climb. If you have the option, it's better to deviate upwind so that when you thermal you are blown back on track.

NB. When things go wrong you may have to deviate 90° or even 180° to stay airborne



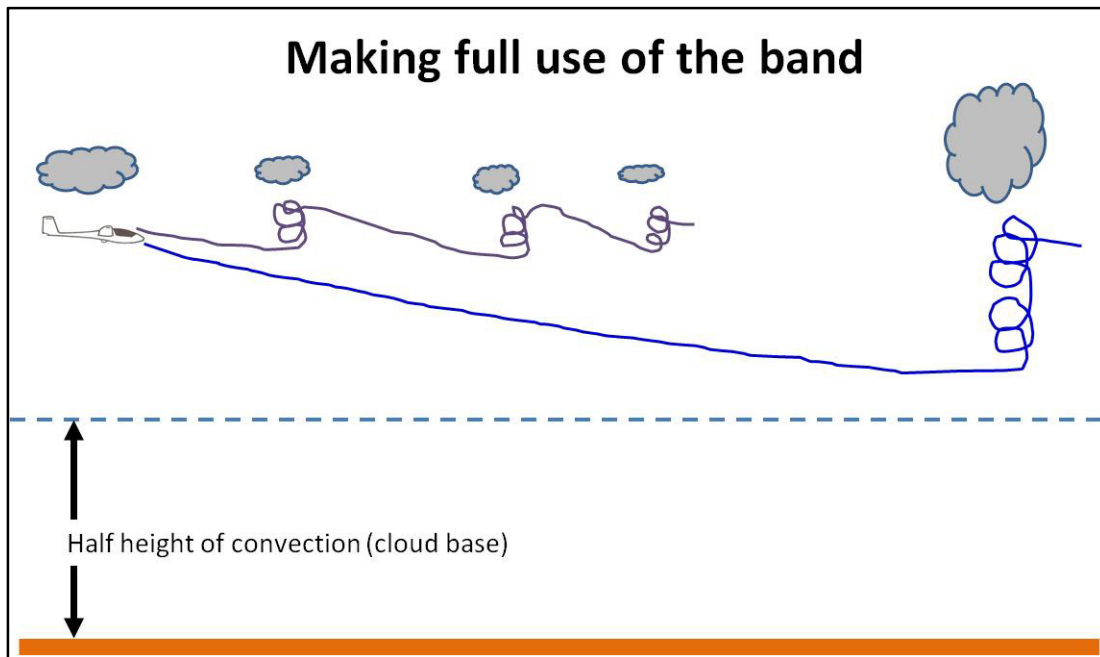
11.2 Operating band

The operating band theory says you should be working in a band roughly half the depth of convection. So, if you have a 4,000' cloud base, you should be working between 2,000 and 4,000'. Within this band, you should only stop for climbs that are equal to or better than the average for the day. Below the lower limit you slow up and take any lift.

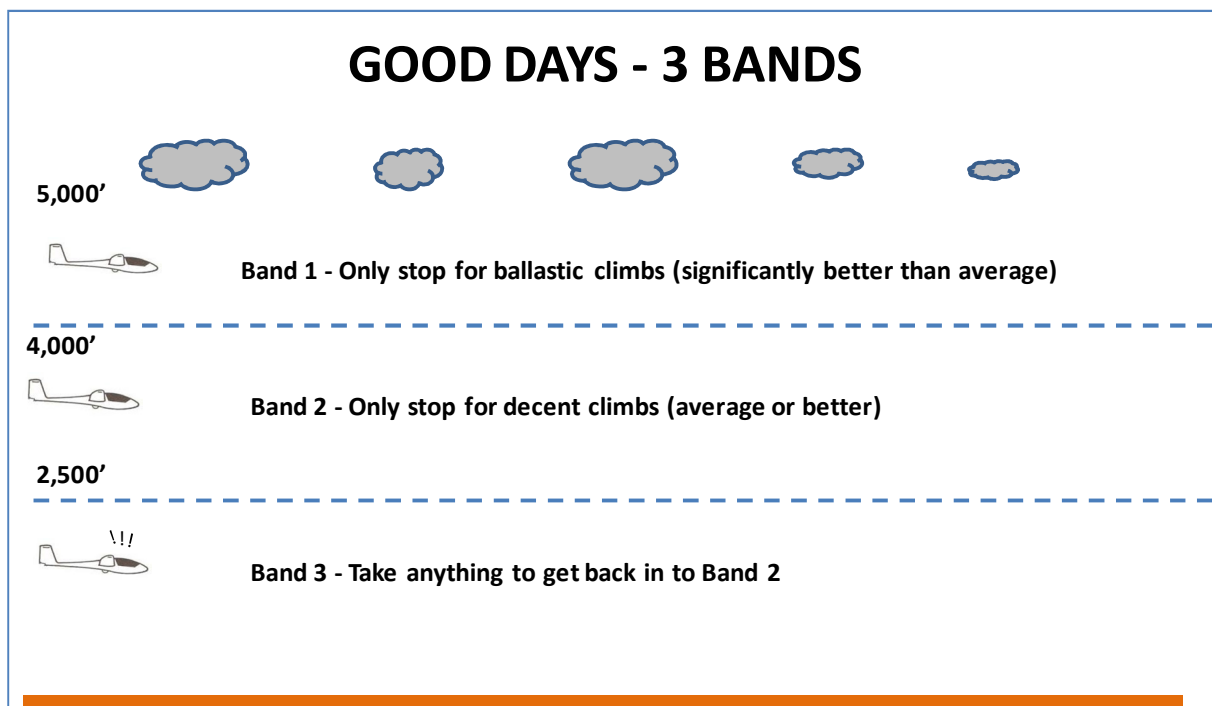


NB, The "half the depth of convection" theory only works when you have a decent depth of convection, say 3,500', below that the lower limit ends up being too low.

The aim is to make the most of the operating band to reach the stronger thermals rather than using weak thermals to maintain altitude.



On good days, I find myself operating on three bands:



11.3 Climb selection: Andy Davis's Big Question

As you are thermalling, Andy suggests asking the big question:



***If I leave this thermal right now
is there a good possibility of
finding stronger lift?***

YES

Leave

NO

Stay and climb some more
then

Ask the question again a bit later

Andy's advice is:

- Always stop and circle if the climb appears to be better than the day average
- As you get lower be prepared to invest more time
- Continually scan ahead and review climb rate
- Ask the BIG QUESTION regularly
- The fastest pilots generally take the strongest climbs,
- BUT.....before deviating far off track for an isolated good climb, consider INVESTMENT and RETURN
- Resist the temptation to turn in every bit of lift

"One way of failing is to hang around too long rather than pushing on - the only real race is against the day, it will end."

Tom Gooch

11.4 Speed to fly

The good news is that speed to fly is not that critical. Compared to choosing the best route and only climbing in decent thermals, it has a relatively low impact on overall speed.

Remember:

"...the race isn't won by the runner that runs the fastest, but the one that spends the least time sitting down"

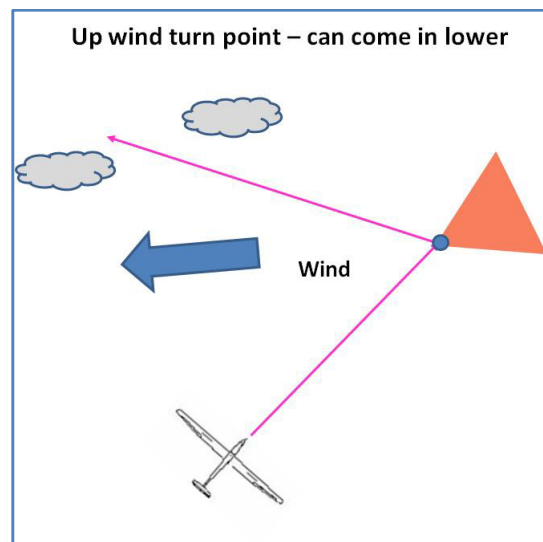
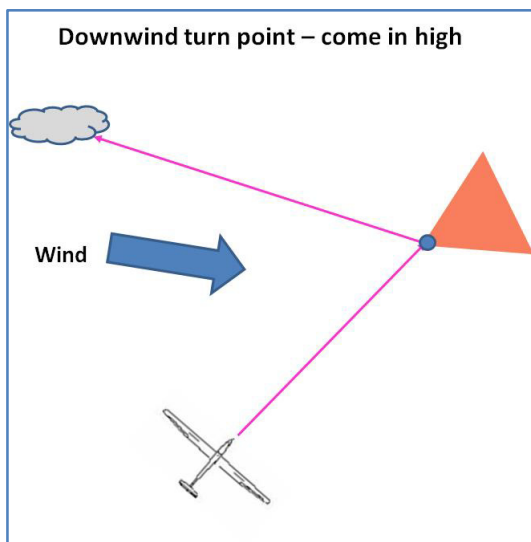
I have never managed to get to grips with MacReady, so I just I decide my speed based on high I am and how confident I am in the sky ahead.

Confidence level (gear)	Status	Air speed (Mosquito)
High	Last climb was good Am at a decent height It's looking good ahead for the next couple of climbs.	70-80 Knots
Medium	Not looking too bad.	60-70Knots
Low	Survival Mode	50knots

11.5 Flying round the turn point

Conditions are almost always crap at the turn point.

As you are approaching the turn point (5-10 km out) you need to have a good look at the sky around it and down the next track, and decide how you are going to get round it. It may be that there is a decent cloud immediately down the next track or you may have to go behind the turn point to get a good climb before heading off down the next track.

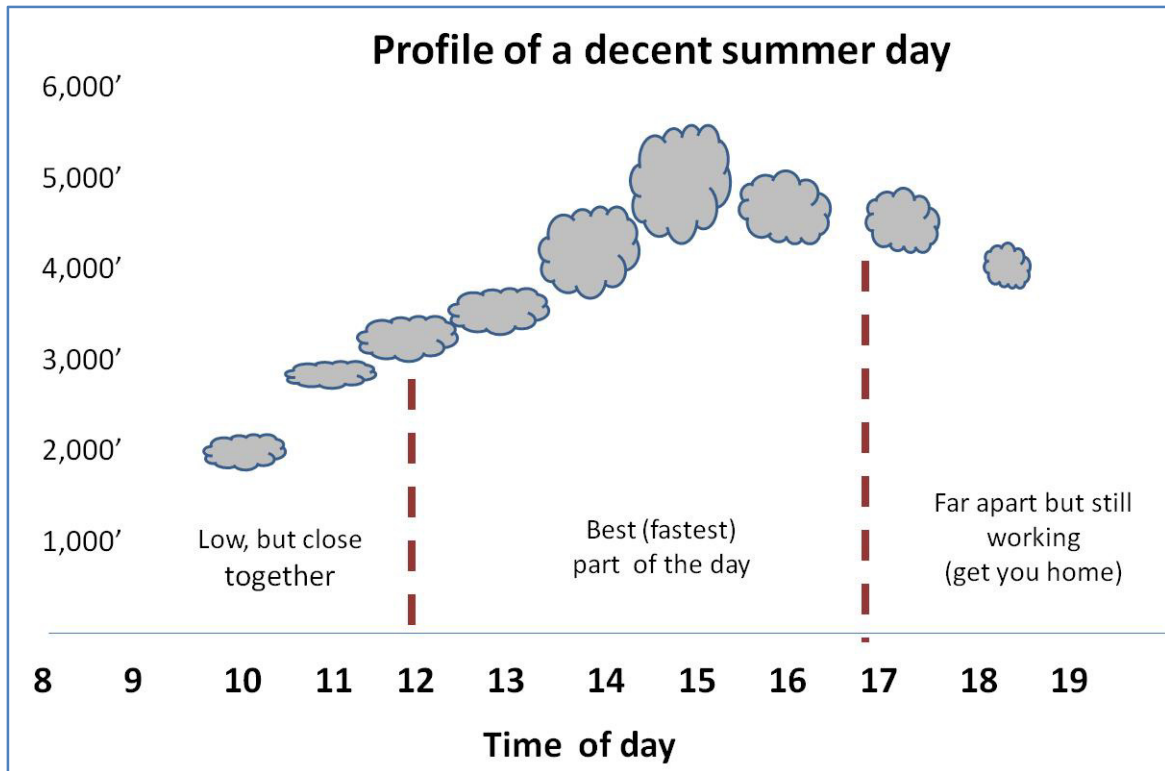


“Statistically you are more likely to land out near a TP than elsewhere! Minimise your workload and plan ahead so you can continue to concentrate on making soaring decisions.”
Sarah Kelman

12. Using the whole day

“It's amazing how far you can go even at quite low levels in the first couple of hours.”
Mike Oliver

If you want to do long distances you have use all of the available day. Your first 300k is likely take you around 6 hours, so you either need to start early or be prepared to fly in late afternoon – early evening.



Mornings

Clouds base will be lower, 2,000' – 2,500', the clouds less distinct and climbs weaker, but the good news is they will be closer together. If you can stay up around AD, the chances are you can stay up a few km down track, so you might as well potter off..

Evenings

Providing there is sun getting to the ground, days go on longer than you think. Typically climbs will be further apart but still going to a decent height.

13. What to do when it all starts going wrong

“You need to keep looking a long way ahead to plan your route. If things start to look tricky, you need to know when to change gear and go into survival mode. I've always been a bit conservative and consider height as insurance, so always try and have as much height in hand before things start to get difficult, rather than blundering along into the bad air without much height. Otherwise you could be stuffed. Reading the sky is crucial for survival, so look for ways around the difficulty, even if it means diverting quite significantly off track. Far better to be in the air a few kms off track than landing out early. Be patient”
Paul Gentil

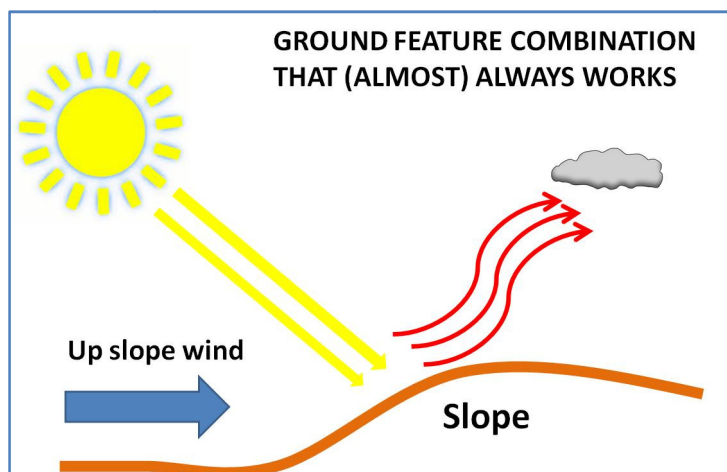
13.1 Strategies

Part of the skill of cross-country flying is spotting when conditions are starting to deteriorate and “changing gear” accordingly, i.e. slowing down, taking weaker climbs and wider deviations to conserve altitude, so that you leave yourself with as many options as possible.

Situation	Strategies
Last couple of climbs weren't that good. It's not looking very good ahead, e.g. over-convecting.	Slow down Try to stay high. Look around for better areas off track.
Big blue gap	Can I get a really high climb to give myself a good shot at crossing it? Can I deviate round it? Where are the nearest clouds? Park up for a bit and see if anything develops, e.g. wisps in the blue
All gone overcast, not much lift about	Conserve altitude. Head towards known airfield / safe landing. Switch to stepping stones mentalityif I can get to Enstonethen I'll try for Little Ris. Look for where any sun is getting to the ground and head for it. Park in weak lift, give things time to develop
Starting to get uncomfortably low nothing decent in range	Start picking fields Is there a promising ground feature I can try, e.g. slope with a bit of wind and sunshine.
Survival mod	Local soar near a decent field. Pay more attention to ground features. Look for anyone climbing – buzzards, other gliders Fly really neat (string straight, brilliant speed control) If able to gain a little height - field hop i.e. look for next landable field on track, can you reach it? Don't give up

13.2 Ground features

As you get lower, you will need to pay more attention to ground features as sources of thermals. By far the most reliable ground feature is a slope with a bit of sunshine on it and some wind blowing up it. This combination will almost always generate a thermal and has saved my bacon many times.



Key point 7 Slopes with sunshine and on-slope wind almost always work

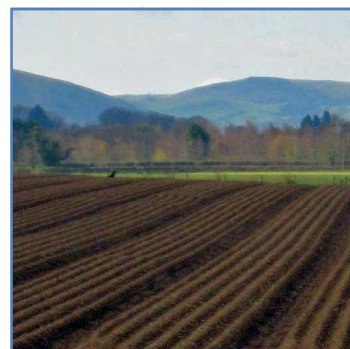
Other features that are worth a try include:



Built up areas



Fields being combined



Ploughed fields

13.3 Survival - a couple of how I dunnits

Getting back from Banbury

This was on a day when six of us had set off to do Aston Down – Newbury – Oundle-Thetford - Aston Down. We had a good run to Oxford, but then conditions deteriorated and we all ended up at Bicester under a lot of overcast.

With the sky to the north and east looking pretty awful it was another “*What are we going to do now?*” moment I saw Phil level his wings and head out to the west and wondered where he was going. I could see a couple of wispy clouds under the overcast to the north and thought I they’d be worth a try - If they didn’t work I might just make it back to the airfield.

When I reached the wisps they looked even more insubstantial, but there was some weak lift under them, just enough to keep me airborne at 2,000’ over the disused runways at Finmere. It was time to park up and see what developed. After I had been circling for about ten minutes in weak lift, another glider slipped underneath me and started circling a little way off to the east. I went over to join it and found myself in a decent thermal – thanks buddy! As I was circling, I heard Mike calling Jon on the radio, saying he was abandoning the task and heading back to Aston Down. With my new found height I thought I would just press on a little bit, heading in the general direction of Northampton. A good climb to the north of Silverstone, was enough to get me over the M1 motorway to the west of Northampton.

The way ahead to the north-east looked black and horrible and there were ever more calls on the radio complaining of overcast and showers. I watched a glider disappearing into the gloom and decided I definitely didn’t have the balls to follow it. It was time to turn for home. I reprogrammed the GPS and got a nice pink line showing me the way back to Aston Down.

A long glide got me to the north of Banbury where I hit the strongest thermal of the day. The gust was so strong it took both my hands on the on the stick to get the Mosquito to bank into the rushing air. Once centred in the core, it was like taking an express elevator back up to cloud base at 4,500’.

The thermal was great, but the way ahead looked dire. On-track for Aston Down the sky was all grey overcast, no cumulus and no sun getting to the ground. I didn’t think there was much hope of staying in the air if I headed in that direction. I figured my best bet was to head for Edgehill, 10km to the west, where I at least I would be able to land safely. I reached Edgehill at a comfortable 3,000’ but the air felt very dead and ahead of me the sky was still horribly grey and lifeless. Not knowing what to do next, I just floated around close to the airfield, gradually losing height, watching the other gliders launching and landing.

After I had sunk below 2,000’ I noticed the sun had got through the overcast and was shining on the fields to the north-west of the airfield. In the hope that something would happen, I headed in that direction. I was down to 1,500’, very close to the point I would

have to give up and head back to Edgehill, before I felt the first bubbling of a thermal. At first it was weak and broken, just enough to keep me in the air, but gradually it strengthened. As I was circling I noticed a flat wispy cloud develop under the grey overcast over Shipston-on-Stour, about 7km away on track. I figured if I could get back up to 3,000', I could just about reach it and if it didn't work at least I would be a few kilometres nearer home.

When I reached 3,000' I set off for Shipston. I was expecting a nerve wracking glide to the cloud, but under the grey overcast things weren't as bad as I imagined. There were little bubbles of lift, not big enough to turn in, but enough to stretch out my glide slope. The cloud at Shipston worked and carried me back up to 3,500'. Things still looked grim on track, but I could see a good field a few kilometres ahead, so I set out anyway. Conditions looked better to the west -the grey overcast had broken to reveal a blue sky out over the Severn valley. I headed towards the nearest patch of sunshine at Moreton-in-the-Marsh, over on my right. Overhead the Fire Service training college, I ploughed into a solid load of sink. As I increased speed to get through it, I consoled myself with the thought there must be rising air on the far side of it – what goes down must come up, somewhere. But the sink was relentless and I was soon down to 1,800 and picking fields again. There was a long stubble field to the north of the Fire Service College, the only trouble was it undulated like a camel's back.

Down to 1,500' I pressed on into the sunshine in the hope that something must be working somewhere. At 1,200' I finally gave up and turned back towards the camel field. Just as I completed the turn I hit the gust of a thermal and immediately turned into it. It was broken and gusty and, determined not to lose it, I banked over as steeply as I could,. It was so narrow, that my turns were only half-in and half-out of it, but it was enough to stop me losing any more height. I stuck with it and gradually it opened out and I was able to start climbing.

The thermal fizzled out at 2,500' so I straightened up and headed for Stow-on-the Wold. My thoughts were now on getting to the airfield at Little Rissington, on the top of a hill above Bourton-on-the-Water, a few kilometres south of Stow. Less than an hour's drive from the club, Little Rissington is a respectable place to land out. If I could get there it wouldn't be too embarrassing.

Back down to 1,500' at Stow, I needed another climb. I spotted a Red Kite circling a little to my left and headed across to join it. As we were circling in the bumpy lift, I spotted what at first I thought was a model aircraft below me. Then I saw another behind it and became apparent these weren't models but a couple of Typhoons at low-level. They zoomed beneath me and the Red Kite before disappearing to the north. Back up at 3,000' I could see the runway at Little Rissington and a couple of promising clouds above it, so set off in that direction.

I tried calling the airfield to warn them of my approach but there was no response and when I reached the airfield at 1,800' it was deserted. It still felt a bit naughty flying directly over the runways as I headed for the two clouds on the far side of the airfield. As luck would have it, the clouds, that had looked so promising earlier on didn't work. All that was left of the dead thermal was a bit of turbulence and a lot sink. After a lot of twisting and

turning trying to find lift, I was back down to 1,300'.

My last chance was to head out to the right of the airfield, where the sun was shining on the west facing slope of the hill. The south-westerly wind would be blowing up the slope and if anything would trigger a thermal this combination of wind and sunshine should. At the very last minute, just as I was about to give-up and turn back for a landing, it delivered and I flew into another big gust. I banked the Mosquito over as far as I dared and managed to centre on the narrow, gusty thermal.

The thermal carried me back up to 3,000' and for the first in time in hours, I started to think I might just make it back home. The sun was streaming out of a now clear blue sky, the route back to Aston Down was familiar territory and I could even see Cirencester in the distance.

Leaving Little Rissington I headed for the first cloud, half-way between Bourton-on-the-Water and Northleach. It was a good looking cloud and as I approached the side of it there was a good strong gust. I banked in the gust, but after half a turn I was in sinking air. I was quite tired by now and couldn't be bothered to try and centre in the thermal, so I just headed for the next cloud. Following the arrow-straight Fosse-Way towards Cirencester, I dolphined along in the updrafts. I lost a bit of height but not much. By now, I could see the hangars at Aston Down, but didn't quite have enough height to get there. I dolphined into another strong gust and this time banked steeply into a turn. A few more turns and I was at 3,000' - plenty high enough to get me back. I levelled the wings, I slipped the flaps to -1 and lowered the nose until the Mosquito was whizzing along at 90 knots. The altimeter started to unwind, but the glide angle to home was steep enough – I was going to make it.

Just keep going: getting back from Sherbourne

I set off heading north, but by now the sky just did not look good. There was something about the look of the clouds - rather scrappy and just hanging in the air with no distinct base - that did not feel right. I pressed on, but none of the wisps I tried worked and the only promising clouds were a long way to the north-west. Now, down to 2,500 I couldn't see anything to go to. I saw another glider well below me heading north, but didn't fancy following him. The clouds to the west over Gillingham looked a little more solid and I figured if I could get a climb there I could make it back over to the high ground of Salisbury Plain where there were some better looking clouds climbs.

When I reached the clouds at Gillingham, nothing seemed to work. I tried heading for the darkest part of the clouds, there would be a gust of lift but as soon as I banked it turned to sink. I was soon down to 1,500' and more than a little worried – if this carried on I was going to end up in a field. And if I did I would not be popular with Robin (my retrieve) – it would be a good three hour drive from the club. But I had to find a field just in case. It wasn't that easy, most were too small or still had standing crops in them. Finally, I spotted a decent sized stubble field about a mile to the east of the town. All I had to do was keep it in range while I tried to find a climb.

For the best part of an hour I struggled to find a decent climb. Thin wisps of cloud would form but when I tried them, they would just yield a short gust of lift that decayed to sink when I tried to turn in it. I'd gain a hundred feet then almost immediately lose it. By now it was getting on towards five o'clock and my hopes of making it back to Aston Down were fast diminishing. I was starting to think that rather than prolonging the agony it would be better if I just landed so that Robin could at least set off and we might avoid having to derig the glider in the dark. After another 15 minutes of fruitless searching, it didn't look as if I was going to have choice. I was down to less than 1,000' and edging closer to my field ready for the imminent landing.

Then, it finally happened - I hit a strong, solid gust of lift coming off the town. I banked steeply into the rising air and for the first time in about an hour and a half the lift continued right the way round the circle. Determined not to lose the thermal I concentrated on flying the tightest, most accurate turn I could. It paid off and slowly I started a steady climb. It wasn't the strongest thermal, but after a lot of circling it got me back to 3,000'. By now it was so late, I felt there was no chance of me getting back home, so the best thing I could do was glide to The Park where I could land safely at the airfield and I'd be able to wait in their club house

I reached The Park at about 1,500', at about twenty past five and apart from one person derigging a glider there was no sign of life. Once again, just as I was about to line up for landing I flew into a strong thermal. This one carried me back up to 3,000. Still resigned to landing out, I figured rather than landing at The Park I should use the height to glide a few miles further north and reduce the distance that Robin would have to come. So I set off towards Warminster.

Pulling up in little bubbles of lift helped me extend my glide, and I managed to get past Warminster, heading towards Westbury before I was back down to 1,800', picking fields again. I spotted a likely looking field on the outskirts of the town, but before I gave up I had enough height to try a solid looking grey cloud that was sitting over the edge of the escarpment. As I flew under the cloud, a big gust pushed my right wing up. With the variometer beeping ecstatically I banked into the gust and was rewarded by the strongest, smoothest thermal of the day that carried me rapidly up to cloud base at a very happy 5,000'.

From here, I figured if I just headed north, the worst that could happen was that I would end up in a field near Chippenham, which in Robin's eyes would be considerably better than one at The Park. There were still some promising clouds in the sky a way to the north and I thought I might just reach them.

I made an awkward little detour to avoid Keevil's airspace before setting off on a long downhill glide that took me past Trowbridge and Melksham. Out to the west, I could see the silver waters of Bristol channel and the Severn estuary - the clouds in that direction were just starting to take on some colour from the descending sun. Approaching Chippenham, I was back down to 2,000, no longer worried, just resigned, and busy looking for a likely field. There weren't any obvious ones, but before it became a problem I found

another climb that got me back up to 4,000 ' feet. This really lifted my spirits, now I could at least make the airfield at Hulavington, just the other side of the M4. It guaranteed a safe landing and is only half an hour's drive from the club. The only fly in the ointment was that it was now past six o'clock and my wife would be starting to worry - she normally expects a phone call from me at around five to say I have landed safely. Come to think of it the guys at the club would probably be starting to get a little concerned as well.

As I approached the line of the M4, just before Hulavington I caught another climb back up to 4,000'. The club was now only about 20km away and there were clouds en-route.

Amazing - I might just make it back! I set off, trying to fly as accurately as could, following the directions of the SatNav and keeping a steady 70 knots.

About a third of the way there I my heard my call sign "594" on the radio:

"594, Cotswold Base"

"Cotswold Base, 594. Go" I acknowledged

"594, where are you?" so they were starting to get concerned

"On final glide about 10 minutes out"

Westonbirt Arboretum slide past underneath me and finally I could see the airfield -unless I hit some horrendous sink I was going to make it back. In the end I reached the airfield at a comfortable 1,200' touching down just after six thirty.

GETTING STARTED IN COMPETITIONS

14. Competition flying

14.1 Why you should fly a comp

Some people are put off the competitive element of competition. Don't be – just think of it as a week's flying where:

- All the met, task planning and NOTAMs work will be done for you – leaving you to concentrate on flying.
- You'll get a great briefing every day.
- You'll be flying with a friendly crowd you'll be able to learn from.
- The launching is really well organised

Other great reasons to fly in a comp are:

- 1) It will give your flying an almighty push up the backside.
- 2) You'll learn a lot from what other people do.
- 3) You'll fly and go cross-country on days you wouldn't normally bother rigging.
- 4) You'll get current on aerotows.
- 5) It's great fun.
- 6) If it's at your home club you don't have to worry too much about retrieves, someone will come and get you.

14.2 Reasons not to fly a comp

- 1) The British weather. Most comps do OK for weather, but it's not unheard of to only get one day's competition out of a possible nine. You can end up wasting the best part of a week sitting around a wet airfield.
- 2) It's a bit more dangerous. A lot has been done to reduce the risk of crowded start zones, but they are still quite risky.

One excuse that is not a valid reason not to fly comps is: *"I'm not interested in competing"*. In your first comp, more than anything else you are competing against yourself.

15. Option for starting out – types of competition

There are three types of competitions that you can consider when you are starting out:

15.1 Inter-league or "Rockpolishers"

These are a set of friendly, weekend comps between local clubs, i.e. Nypmsfield, The Mynd and Shobdon (and sometimes Talgarth), held in the spring and summer and specifically aimed at getting people into competition flying.

For each comp, each club fields a team of three pilots, one for each of the three classes:

Class	Criteria
Novice	For absolute beginners, i.e. anyone who hasn't flown a 300k or a Regionals
Intermediate	Anyone who hasn't flown a 500k (So, you can fly intermediate if you haven't done a 300k, but you might not be competitive)
Pundit	Unlimited

The advantages of flying Rockpolishers are:

- It's a good introduction to competitions – a sort of kindergarten comp.
- It's relaxed and informal.
- There's no formal start – you just go when you want.
- If winching is available you can use it, i.e. you don't have to aerotow, so it is reasonably cheap.
- It's a good place to make your rookie mistakes.
- You get to fly at another club – getting to know the people and their operations will stand you in good stead if you ever land out there.
- The host club normally puts on a barbecue.

Doing a few Rockpolishers comps is a really good way of getting started before moving on to a Regionals – highly recommended.

15.2 Competition Enterprise

Enterprise is a week-long competition, held at a different club each year. It's not BGA rated so won't count towards you becoming a nationals pilot. Enterprise pilots will tell you that conventional comps, with their racing tasks, are designed to minimise your time in the air, i.e. fastest wins. Conversely, in Competition Enterprise the tasks and scoring are designed to maximise your time in the air. So the tasks might be things like – “fly to as many castles as you can in one day” or “whoever gets furthest up and down the east coast mainline”

The advantages of Competition Enterprise are:

- It's more relaxed and informal than a Regionals.
- It's a very friendly set-up.
- There's no start time – you go when you want – so there are no crowded starts.
- They are not bothered whether you use winch or aerotow to launch – so it can be a bit cheaper.
- It genuinely does encourage long, adventurous flights.

15.3 Regionals

A Regionals is a week long, first level BGA/FAI rated competition, i.e. if you want to go on and fly a Nationals and then a Worlds or European Championship you have to have flown a Regionals. Flying a regionals is discussed in more detail below:

16. Flying a Regionals

16.1 Minimum requirements

To enter a rated competition, i.e. a Regionals, you must have an FAI Competition Licence. The minimum requirement for a comp licence is Silver C. Getting a Comp Licence is a painless process - it can be done online at the BGA website and costs £19.

Apart from a Comp Licence, to enter a Regionals you need to be:

- current on aerotow;
- reasonably comfortable/competent sharing thermals (starts can get crowded)
- have some experience of at least 200km tasks (having done a 300k is better);
- OK with field landings

16.2 Costs

If you are flying at your home club you will need to budget for:

- Entry fee £150.00 - £200.00
- Aerotows, say 6 x £30.00 = £180.00
- Retrieves if using someone else's car £30 - £50 each (use 45p/mile).

If you are flying away from your home club you will need to budget for accommodation (most people camp in the airfield) and meals.

16.3 Objectives

If it is your first competition your objectives are pretty simple: not to come last and not to crash. Anything else is a bonus.

16.4 Preparation

A head of the competition you will need to make sure:

- your trailer is road worthy;
- your batteries are good shape
- you know your way round your flight computer - speaking from experience, Day One of the comp isn't the time to be learning how to edit turn point geometries and set up multiple tasks;
- you have at least flicked through the competition rule book.

16.5 Winning by not screwing up

Mike Bird ("Platypus"), a keen competition pilot wrote a series of articles on the subject of "Winning by not screwing up", i.e. avoiding gross errors that can mess up a competition

Things like:

- programming the wrong turning point into your GPS;
- forgetting to switch your logger on;

- running out of battery power half-way round the task;
- flying into airspace.

So it is absolutely worth spending time to ensure your kit is sorted and you know how to use it.

16.6 A typical competition day

Here's how it works on a typical comp day:

16.6.1 Rig and grid

If the weather is looking good, the instruction will normally be to rig and grid before the briefing – normally set for 9.30 or 10.00. It's good to be onsite by 7.30 – 8.00 so you can take your time rigging and getting prepared before the briefing. Your position on the grid is determined by a lottery on Day 1. Thereafter, those at the front go to the back and every one moves up.

16.6.2 Briefing

Don't miss the daily briefing. It covers:

- Yesterday's results (if it was a race day)
- "How I dunnit" speeches from the winners
- Domestic notices - catering arrangements, blocked toilets, that sort of thing.
- The day's met
- The day's task(s) depending the weather there will be an "A" task and a shorter, fallback "B" task.
- NOTAMS
- Start and finish lines.
- Expected first launch time.



16.6.3 Preparation

Once the briefing is complete you will need to

- Mark up your map
- Programme your GPS

Thereafter, your priority is to get you and your glider completely ready for the day's flight, including:

- GPS all plugged in, programmed and ready to go.
- Map
- Sandwiches and water on board.
- Pee arrangements
- Phone charged – it's generally better to switch your phone off while you are flying to conserve the battery.

- Water ballast if you are using it.

Normally, you'll have at least an hour to play with. Once you are completely sorted you'll have to park your car away from the grid. When you have done this you don't want to have to keep going back to it, so for example I keep a pen, ruler and small bottle of meths in the glider so if they change the task I can re-draw my map. You also need to decide where you are going leave you car keys – they are no use to anyone in your pocket when you are in a field 50 miles away.

16.6.4 Grid squat

There will almost certainly be a period of waiting to see how the day's weather develops.

The Director has to decide:

- Is the task on? It's no use sending everyone off if there is no hope of getting round.
- Is it safe to launch? The cloud base has to high enough and there needs to be sufficient lift to safely launch the grid. You don't want 30 gliders all trying to staying aloft in a one ½ knot thermal going to 1,800'.



It can be a difficult decision. If conditions are not ideal, the Director may decide to put back the first launch time or fall back to the "B" task. These decisions are normally announced over the radio and texted to the competitors.

16.6.5 Launch

Once the decision is made to launch the aim is to get all the competitors in the air in less than an hour. Once it gets going, the launching process is pretty rapid and intense, and you won't be popular if you hold it up. So, you need to be in your cockpit, checks done and completely ready to go about 15-20 mins before the launch queue reaches you.

You will be towed to 2,000' and dropped in one of the agreed drop zones. As the sky is so crowded you may get FLARM alerts on the tow.

16.6.6 Waiting for the start line to open

The start line opens 10 minutes after the last competitor has launched. This means that if you were one of the first to launch you may be hanging around for ¾ hour before you can start. If it is a good day, it is safer and less stressful to go and thermal some distance away, e.g. go up wind a bit or go and explore down track a bit, this will keep you clear of the tugs and other competitors. On a less than brilliant day, you may end up with 30 plus gliders all trying to stay up in a couple of indifferent thermals, with glider-tug combinations flying round them. This is where it gets fraught, or just plain scary. You will need to keep an extremely good lookout and take great care when joining, staying in and leaving thermals - the chances are there will be someone in close proximity above, below and opposite you.

16.6.7 Starting

The start line radio will count down to the start line opening, giving warning calls at 10 minutes, five minutes and one minute to go, and then there will be a call along the lines of *“The start line for the Little Wallop regionals is now open, maximum start height 3,000’ ”*

The good news is start zones are pretty big – hemispherical columns, 10km in diameter (5km in radius) up to the maximum start height. You have to pass through this zone to start.

- In general, it is better not to be the first one to start – it is a lot easier if there are a few gliders down track when you set off (particularly on blue days).
- If the day is going to be a short one, e.g. top cover coming in, you may want to start as soon as you can.

Once you have started you must call control with your start time (minutes passed the hour). If things don't go well, or for some reason you end up back behind the start zone you can re-start – just call a new start time.

16.6.8 Flying the task

Tips for flying the task are

- Fly your own task, i.e. use your own judgement and don't slavishly follow others.
- Don't try and second guess what others are doing.
- Don't go flat out – it's more important to get round the task, or far as you can, than it is to do it quickly. You don't get many points for flying at 90knots into a field.
- Don't take risks with airspace – the penalties are high and infringements bring the whole sport into disrepute.

Warning: Field Landings

The pressure of flying in a competition can affect your judgement when it comes to field landings. Because it is comp, there is a temptation to push things that little bit further, carrying on trying to find a thermal when you should have made a decision to land or leaving field selection that little bit later. Be very careful of these pressures – don't let yourself be suckered into a situation where the field picks you.

16.6.9 Finishing – Final Glide

Your final glide should be convex rather than concave in profile, i.e. starting with a decent margin over the final slope path and gradually increasing speed to reduce the margin as you get closer to the airfield, as opposed to starting with little or no margin and trying to stretch it.

You should make radio calls to control as five and one minutes out – the main purpose of these calls are to let other gliders who may be finishing at the same time as you of your presence. You need to listen out for similar calls – there may be gliders just a head or just behind you.

Don't feel you have to do a competition finish. A decent approach and landing that takes you across the finish line is all that is required.

Be considerate of other finisher, e.g. if you know there are gliders behind you, land long and push your glider out of the way if necessary.

16.6.10 And finally

Once you landed you should get your logger file to the scorer as soon as possible. You will need to get your batteries on charge for the next day. Then you can retire to the bar.

Happy soaring