

# Reading the sky ahead

In the first of a series on cross-country soaring, Jay Rebbeck explains how to improve decision-making

**W**HEN WE'RE flying cross-country, the picture as we look ahead is packed with potentially useful information to help us decide where to point the glider.

While a fat cumulus cloud lying bang on track might seem the obvious place to go, that won't always be the best decision. If a hard right avoids that juicy cloud, but takes you to a cloud street that runs for 100km and arcs back onto track, then which option would you choose?

The point is that we need to make decisions on two levels. As well as short-term decisions based on the weather immediately ahead, we also require a long-term strategy.

This article looks at how short- and long-term decision making might come into play when we're going places on ridges, in thermals, and in wave.

But before we decide where to go, we should first evaluate what's lying in front of us.

## Types of cloud

Orographic cloud: any low-level, scuddy-looking cloud is bad news. A sign of very moist air, it offers little chance of soaring. Cumulus: the size, shape and colour of cumulus tell us how good the lift will be.

John Coutts' article (*Getting to the core of clouds*, June-July 2000, p30) covered this topic well. In general, look for the firmest, whitest clouds, with the flattest and best-defined bases. When arriving under a solid cloud, look directly up for discontinuities: a wavy line in the base where the cloud is darker on one side than the other. In Holland they call this the "eye of the cloud". It is the best indicator of excellent lift when seen in clouds that already looked very good. Don't confuse it with holes forming in deteriorating cu! There is also a relationship between the vertical development of a cu and its life span.

Assuming it's still active, with a well-defined base, the rule of thumb is that the deeper the cloud, the longer it will

produce lift. When there are towering cumulus clouds ahead, you can expect lift to last for much longer than when they are very shallow. This should be considered when deciding whether to make a long glide to distant clouds.

Stratus (layer cloud): the problem with middle-level cloud is that it cuts out the sun's heating effects. In the UK, there are often days where cu feed the stratus layer. The sun then burns holes in the stratus, allowing convection to start again, only for cu to fill the holes again. The trick is to monitor the cycle carefully and remember that on these days sunshine is king. When there is sheet cloud cover ahead without sun on the ground, always get high. Only get low when arriving under developing cu being fed by strong sunshine!

Alto cumulus: these are totally useless to the soaring pilot. They are formed from middle-layer instability and not by thermals rising from the ground. Watch out for them, though: on a couple of

occasions I've mistakenly headed off for a distant cu only to realise it's a deceptive alto cu.

**Cirrus:** this is highly relevant as it may move quite rapidly, has a big impact on the amount of sun reaching the ground, and hence the overall strength of thermals. This is probably the single most overlooked factor when pilots evaluate the sky ahead. Although the picture may look uninviting because of ragged cumulus and little sunshine, the root cause is thickening cirrus (or "top cover" as it's sometimes known.)

**Lenticulars:** these are not always the classic elliptical shape as seen in New Zealand, and are not, of course, always accessible from low down. However, if you spot them, think about the influence they may have on thermals or ridges: when in phase with thermals they can produce unexpectedly good climbs, but when out of phase, can even stop ridges working at all!

### Terrain

Watch out for any ridges facing into wind and avoid flying downwind of these. Also, observe whether the ground is conducive to good soaring. For example, when flying in Holland I found that rivers and their surroundings were always difficult, and I needed to get high in order to cross them.

### Wind direction

When interpreting the sky ahead, your awareness of what the wind is doing is critical. Various indicators help us work out the wind direction on the ground: chimney smoke, for starters. It can also be gleaned by observing the pattern or ripples on lakes; the upwind edge will show an area of flat water parallel with the upwind bank. This is the side of the lake in wind shadow. The wind can also be found at higher levels using, for example, the Cambridge GPS-NAV. Above the clouds, look for tops being blown off by differing upper winds.

Having considered all these factors, how do we decide where to go? As my opening example showed, we need to make decisions both for the short- and long-term. The trick is to have an overall long-term strategy based on the "big picture," within which you have the flexibility to make good short-term decisions.

### Short-term decisions

Always have a short-term plan. Knowledge of the wind direction will help you locate lift under clouds, and help you decide whether a ridge will work. Remember to constantly monitor the wind strength and direction: it may alter due to a change in the weather (eg, an approaching front) or terrain (bending as it funnels up a valley).

An example of a good short-term plan would be: "I'll go to the upwind side of the cloud ahead, then I'll try the two beyond it. If they don't work I'll try soaring the ridge facing into wind, and if that doesn't work I'll land in the good area of fields at the bottom."



Jay, 23, learned to fly on London GC's cadet scheme. He has just clocked up 400hrs as a cross-country instructor for the European Soaring Club in Spain and South Africa. His total is almost 2,000hrs

Always try to plan a few steps ahead. It's always a worry when your last option doesn't work out and you're left with nothing but a "think bubble"!

Follow the best line of energy. When thermal soaring, try and 'join up the dots' to weave under the best lift whilst still moving forwards. When ridge-running, pick the best line of lift – when very low tuck close into the crest, but when higher move out from the ridge slightly. When tracking along a wave bar, experiment with your distance in front of the bar until you find the strongest lift. Then try to maintain that distance. Similarly, try and find the height in the wave where the lift is strongest, and adjust your speed to stay at that height as you proceed across country.

Continually re-evaluate your decisions. Watch clouds carefully. I try to use a "freeze-frame photography" technique, taking regular snapshots in my mind of the sky ahead to see how it's developing. There's no point pressing on to a decaying cu or dispersing lenticular just because it looked good ten minutes ago when you were in decision-making mood...

Don't make a final decision until you have to. Sometimes, when you look at two clouds or ridges a reasonable way ahead you really can't decide which looks the best. It sometimes pays to point between them, whilst you closely monitor options. Only commit to one when you're sure it's the better choice or you *have* to decide.

### Long-term decisions

Get a feel for the day from the forecast. Approaching fronts or expected thunderstorms should make you think of starting earlier rather than later. The forecast also gives an idea of an appropriate task to set. Work out your expected cross-country speed, a conservative estimate of the day's duration and hence a good distance to fly. In competitions with a fixed distance, your speed estimate tells you the approximate time required. Consequently, you can work out what start time enables you to fly in the best part of the day.

Change gear when conditions change. One of the absolute keys to cross-country flying is to spot when the weather is deteriorating ahead, so as to climb high in the last respectable thermals or wave. Similarly, when you see a marked improvement ahead it's critical to save time by pushing into the better weather.

Work out the day's puzzle. Before you start, and on task, try to closely monitor all the factors outlined above, and piece them together to solve the puzzle. For example, one day in the 1999 Standard Nationals, Ed Johnston had a look out on the second leg of the task before starting. Noticing an area of top cover lying over track, he alone chose to divert to the east. By doing so he avoided the problems the rest of us faced and handsomely won the day (and the competition, for that matter).

### Decision-making in wave

Getting into and using wave lift illustrates the need for short- and long-term planning. Getting established in wave requires short-term decisions. Having located the wave bar, you position yourself on the upwind side of it. Here, rotor thermals in phase with the wave may well punch up into the laminar flow. This region can be visualised as a kettle within which lots of individual bubbles are rising up. To get into the wave you must centre quickly on each bubble, but as soon as the climb rate drops off, push forward to the next one. Intensive decisions need making to gain height as quickly as possible until you eventually push forward into that silky smooth lift.

The decision about what distance behind mountains you should look for wave is more long-term. Once, when soaring the European Soaring Club K-21 from Ocana back to Ontur in Spain, I had to choose my route. At 10,000ft, with only 35 miles home across wind, I decided to fly the lee side of a large mountain range. Hoping to make use of any associated wave lift, I expected to find heavy sink. However, when I then turned straight downwind to find the lift, we were in for a real surprise! Ten minutes later, having covered as many miles, we found ourselves sitting in a field just south of Albacete. An example of a bad long-term decision! In retrospect, given the 30kt wind, and the unpredictable nature of the wave in that area, a much better decision would have been to simply avoid the whole area by deviating around the mountains much earlier.

To make good decisions, we must first look at the picture ahead and pick out the relevant factors. Having evaluated wind, terrain and clouds, we must constantly make short-term decisions within the framework of an overall strategy. By doing this, we should avoid running out of ideas. Always have a game plan: if you don't have one, you can't change it...

Next issue: Jay on how to climb better in thermals  
Photographs: the white planes picture co.