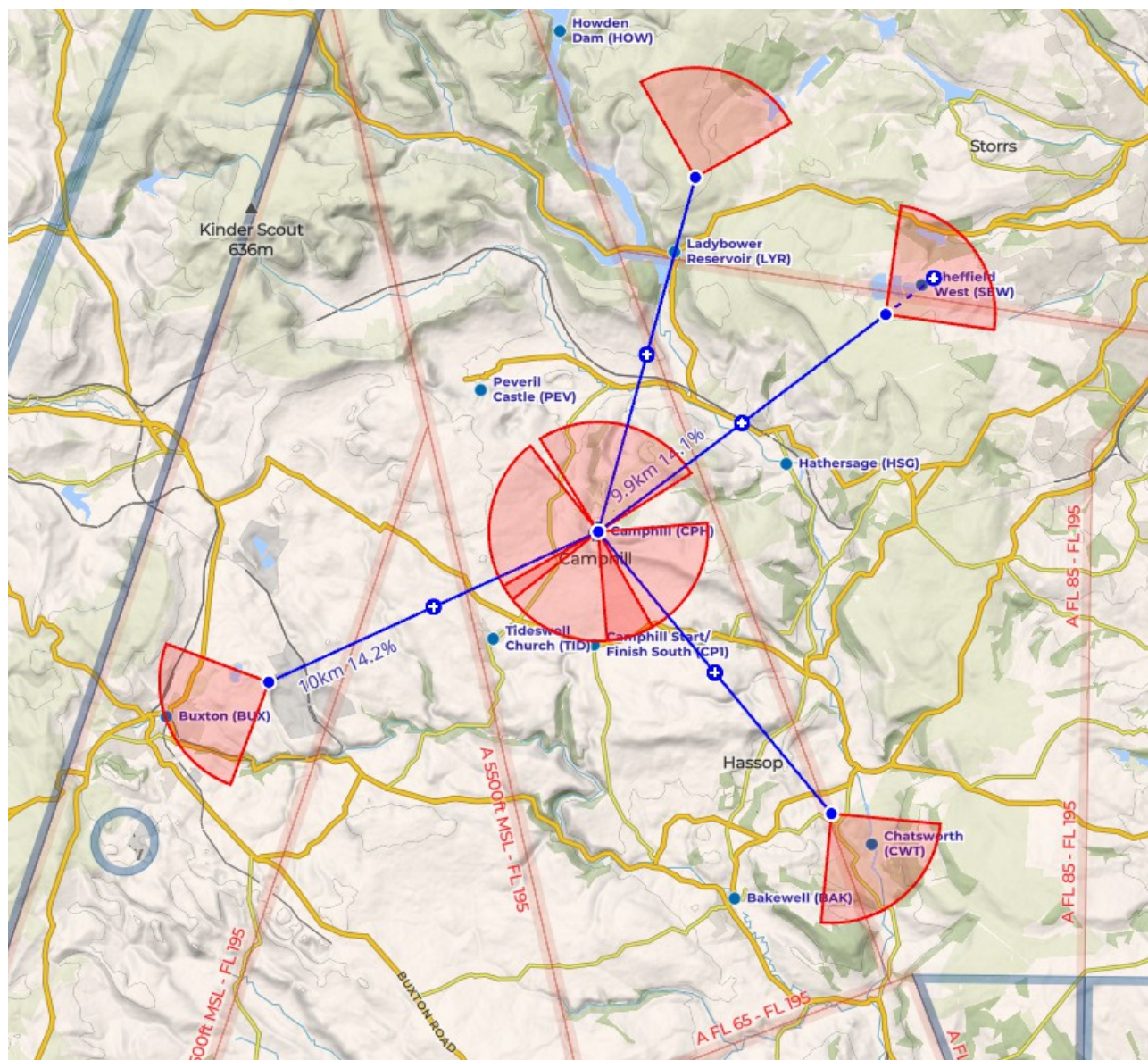


## The Secrets of 'Getting Away'

Leaving the hill can be a scary thought. But people do it, so it is clearly possible. What are the secrets?

### What do we mean by 'getting away'?

Most people stay close to the hill, rarely more than a few kilometres away. In the early days as a solo pilot, with a new Red Card perhaps, ten kilometres (10k) would be a challenge... This image shows a selection of points 10k away from CPH. The turnpoints (TPs) near them all feature in our Blake Robertshaw tasks, and it is worth getting comfortable with flying to them.



### What height is required to get back?

Many factors affect your gliding range, and ability to glide home. These include the performance of the glider you're flying, the wind strength and direction, and your ability to find lift or 'energy'. These combine to compute a height above the airfield from which you could reasonably expect to return. At this height and distance, you are on 'Final Glide'. If you are higher than this, or closer to the airfield at this height, you are 'above Final Glide'.

## The glider

It is assumed that you will be flying one of the club's splendid ASK18s. These have a "best Lift Drag (LD)" ratio of 34:1 at around 42 knots. This performance isn't too far adrift of the 15 metre glass gliders. The ASK18 is certainly up to the job.

However, it is deemed prudent to ignore the manufacturer's stated best LD and assume a much more cautious figure of 20:1. This is what I use in the Discus unless I can see a reason to do otherwise at the time.

## Using the LD to calculate a Final Glide height

Assuming a LD of 20:1, at 10km distance, you'd need to be at a height above the field of  $(10\text{km} / 20) = 0.5\text{km} = 1,640$  feet. We tend to prefer to arrive at the airfield at an appropriate circuit height, so we must add this to our calculation:  $1,640' + 800'$  at High Key =  $2,440'$  QFE.

## What about the wind?

Sometimes there's little or no wind. In this case the figures above are OK. More typically there'll be a wind component. Check the **weather forecasts** to determine how the wind will vary with height. It can easily be double the windspeed at ground level. SkySight for example shows a windspeed and direction both at ground level, and at Thermal Tops height. That's useful because a) that's the height you'll probably climb to, and b) it is a variable height over time.

**Windspeed and direction** can be judged in flight (even in a K18) by looking out of the window. Note your progress over the ground directly beneath you as you circle. Sometimes you stay over the same field for a while, and at other times you'll be moving downwind at quite a pace.

A **headwind** will slow your progress, whereas a **tailwind** will help you. Ignore the tailwind for now, as doing so increases your safety margin. You can vary this as you gain experience.

Headwinds degrade your performance because you spend more time flying to your goal, so you'll lose more height on the way. It also increases the speed required to achieve the best, and now degraded, LD. You'll note also that your speed over the ground is reduced, and it will take longer to return than it took to leave. For these reasons, an additional safety margin is achieved by flying into wind when leaving the airfield.

## The Bottom Line

To cover **10 km in a ASK18**, with some safety margins built in, this is the height you'll need to be 'on Final Glide'.

Headwind (kts)	Air Speed (ASI) for best LD (kts)	Ground Speed (kts)	Sink Rate (kts)	Best LD at this speed by calc	Assumed LD (for safety)	Height Lost (ft)	HK (ft)	Final Glide Height (ft)
0	42	42	1.3	32	20	1640	800	2440
10	44	34	1.5	29	17	1901	800	2701
20	47	27	1.8	26	15	2136	800	2936

***So, in still air, fly at 42 kts, starting no lower than 2,440' QFE. In 20kts headwind, fly at 47 knots, starting no lower than 2,936' QFE. Round up the numbers for comfort.***



### What if you are below this, or you need more height?

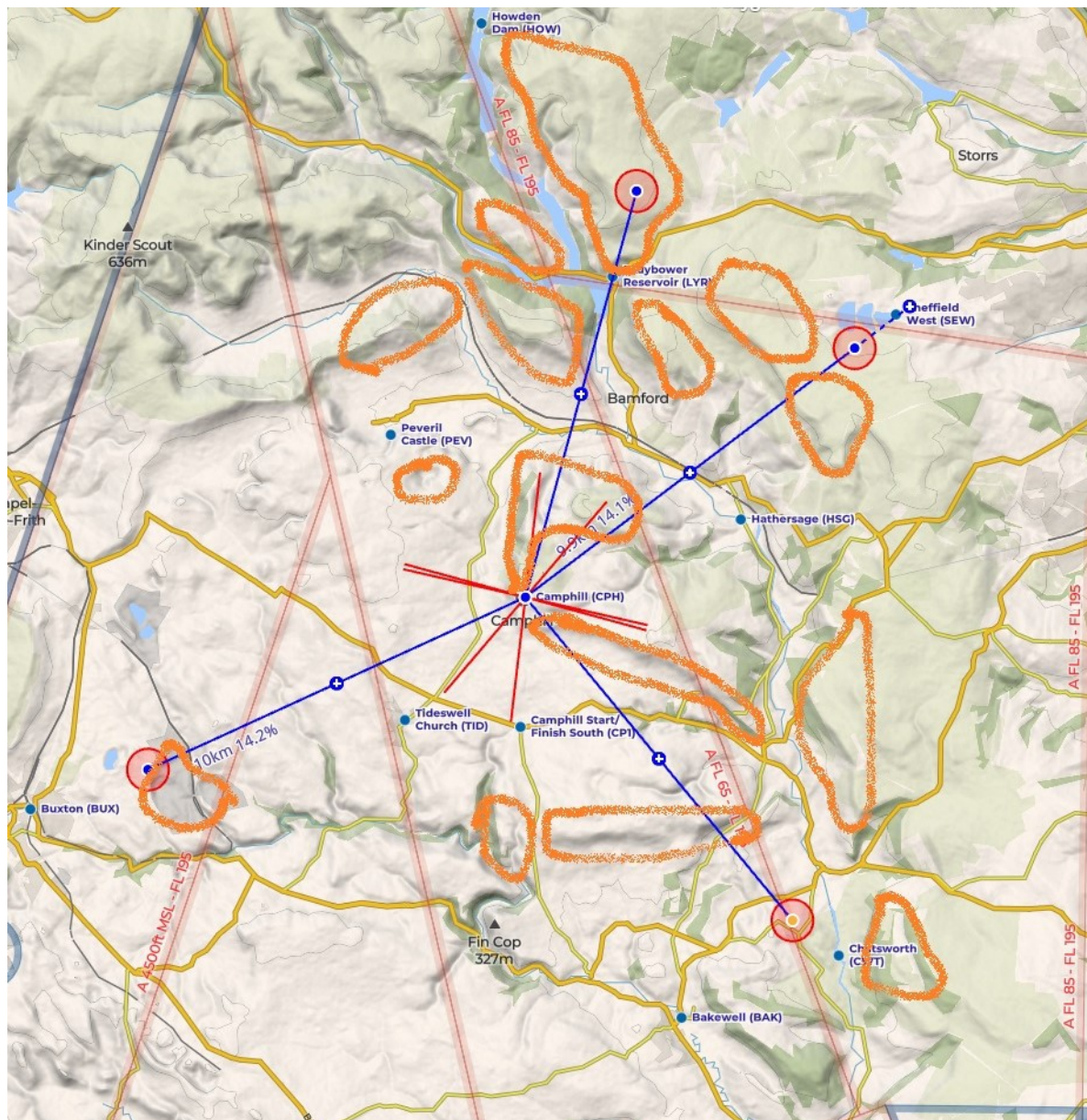
Sometimes the air doesn't behave, and you find yourself lower than desired. You'll need lift. Do not be tempted to slow down to stretch the glide – it won't work. You will need to find lift, or energy. It is assumed here that your goal is upwind, as a goal downwind is often less problematic. If you are heading downwind, apply the reverse of these hints:

Firstly, unless you can see an obvious thermal source or indicator elsewhere, fly into wind when leaving a thermal. You're more likely to find another thermal upwind of the one you're leaving. Often the one you're leaving suddenly improves as you find its real centre upwind of where you thought it was!

Flying into wind from a thermal keeps you in its energy line. This may be marked by a cloud street. Often the energy is there even if a street isn't visible.

If you do hit a lot of sink and it persists, try angling at 45 degrees – sometimes the energy lines fit a pattern as if they were the parallel lines of a set of hexagonal tiles.

Build your local knowledge of thermal sources. This is a sketch of my mental map of where to find thermals, mapped onto those same 10k legs:



These thermal hot spots can be used on the way out, as well as on the way back. As you explore, you'll find more of your own. Whilst not true all the time, you will find usually lift on the way back in the same places as on the way out. Try it when there are clouds to mark the thermals. Then try those same spots another time in the blue. If you find those closest to the airfield are working, it is likely that those across the valley also working.

How many times have you been above 3,000' QFE over Abney Moor? Now you can see that in theory at least, that is sufficient height to return from 10k away, even into a 20kt headwind. **I recommend exploring these limits upwind first.**



*In ASK18 JKU, at 2,400' QFE, 5km from CPH, approaching Win Hill and Hope Brink, with sun on the ground and thermals ahead. "Go for it!"*