LOW-DOWN ON THE ALPS

William Malpas, who lives in France and spends much of the season mountain flying, continues his advice to British pilots who are taking gliding holidays abroad

My first mountain flying article in the April 1988 issue, p66, was concerned mainly with thermodynamic lift in the Alps, particularly with the question "How to find it?" This second part suggests what to do when you have found it.

For "plainsmen" the basic skill for successful cross-country flight is exploitation of thermals. For the Alpine pilot the corresponding skill is efficient utilisation of thermodynamic lift. The average British pilot has no problem with other forms of lift which occur in the Alps, but if he wishes to fly long distances during the summer, it will be largely thermodynamic lift that he will use.

How close?

The first-time pilot in the Alps is sometimes confronted with the problem of flying close to mountain sides while still on tow for his first flight! The tug pilot is trying to save him time and money and will be very unhappy if the glider pilot tries to "rudder" away from the rocks. This will tend to pull the tug even closer. And here we have the first question: how close is close?

If you refer back to the illustrations in the previous article, you will see that lift is represented by arrows which hug the mountainside. So the logical answer is: As close as possible, since the closer to the mountain the stronger the lift. However, logic can be taken too far! If a group of experienced Alpine pilots is asked "How close do you fly?", the answers will always start with the qualifications. Smooth ridges are much safer to approach than jagged ones and if the ridge is unfamiliar the approach should be gradual.

The question is also complicated by the subjective nature of how to appreciate closeness and answers such as one or two wing spans are often misleading.

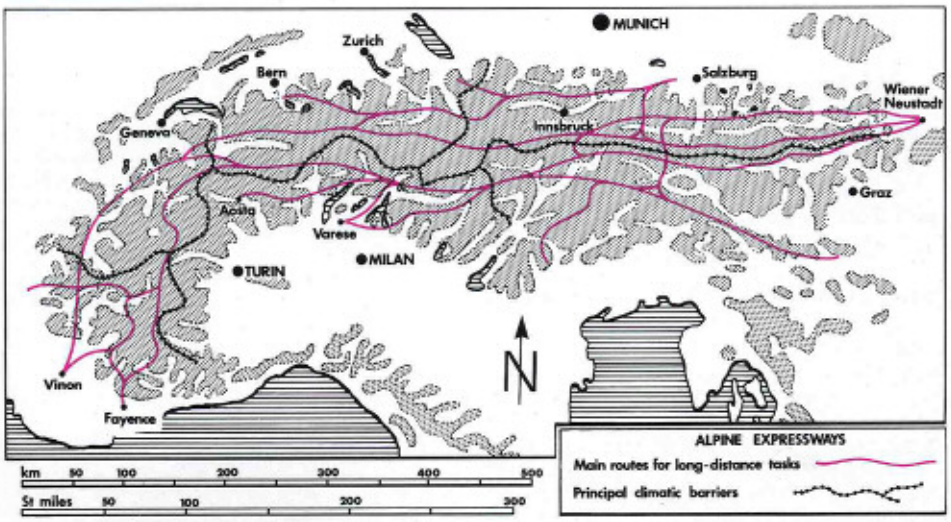
Some pilots find such closeness hard to sustain and until they have become accustomed to the situation, it is better to stay farther out, especially if, by yielding to the natural tendency to "rudder" or bank away, they are flying inefficiently.

Thermodynamic lift

In case the term is unfamiliar, please note the Oxford Dictionary definition: operating by the transformation of heat into motive power – which is already not a bad description. But more appropriately, the word neatly joins together the familiar ideas of thermal lift and dynamic lift, or hill lift. and that is what happens in the Alps.

How fast?

Exploiting thermals over flat country we have learned to fly as slowly as possible, even in steeply banked turns. If you do the same thing close to Alpine rocks, you are living dangerously. Depending on the glider, and depending on the degrees of turbulence and gustiness, speed should be maintained at a level where the glider is **instantly responsive** to all controls. This may mean flying at 70kt or more – there is no safe rule of thumb. It is a question of the feel of the controls. In any case, you will not be looking at the ASI because of the proximity to the rocks, so waggle those ailerons slightly to make sure that you can turn sharply and instantly when you need to do so. Neither is it any use looking for the horizon to check the attitude of the glider. If you are below the top there is no horizon! Even if you know a ridge, each time you return you must "re read" the indications; the angle at which you "crab" along the face, and the locations of sharp turbulence and wind shear.



The map shows the main Alpine expressways from Wiener-Neustadt in the north-east to Vinon and Fayence in the south-west. Notice how they tend to parallel the main climatic barriers rather than crossing them, and how they follow the mountains either side of the main rivers: Enns, Mur, Drau, Salzach, Inn, Add, Rhein, Rhone, Isere, Drac, Durance, Verdon. From Wiener-Neustadt to Fayence is approximately 1000km.

Ridge flying

So there you are, (say) two wing spans from a rock face. What do you do next? Flying on the hill at home you would wait for a surge of lift, check for other gliders, turn sharply 180° and beat back along the hill. In the Alps you will do the same, and you will be constantly on the search for a surge which you can turn into a real gain of altitude instead of a beat which merely holds the gain. The difference is only a matter of frequency at which the good surges occur. Whereas at home the good thermal off the ridge is reserved for certain days, in the Alps it is a daily phenomenon.

If you are well below the top of the rock face, the lift may be weak. It will be necessary to anticipate the surge by picking a spur or a ravine which is well exposed to sun or wind, or both. Don't wait for sight or sound of the vario. If you do so, it will already be too late. Turn immediately the surge is registered by your bottom. You turn towards the valley as tightly as you can without weakening your control over the machine and with a good look out for other gliders you are faced with a **decision** – to straighten up for another beat or to continue the turn. If in doubt, straighten up. If subsequently you decide it would have been better to thermal, you can always come back to try again. In the Alps, the lift will usually still be there! If you are fairly new to the Alps you are unlikely to have the "stomach" for thermalling close to a mountainside so no decision will be necessary.

Thermalling close to the mountain

Having completed 180° of the turn, if there is plenty of room, if the surge continues all the way round and if you have adequate airspeed you may continue the turn. But remember, you are now in the most vulnerable configuration in mountain flying. You are steeply banked, facing the mountain. If a gust now tries to modify your turn and you do not have the airspeed to resist it, you may not live to make another.

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Going up

Assuming that you are making beats with 180° turns over suitable spurs – a very common situation – the next question which arises is: Are you going up?

You may be going up so slowly that it does not register with any certainty on the altimeter. Look at the trees or rocks as they "go by" on each beat. Pick a particular branch or rock and if you are just a little higher on the next beat, continue "tree-climbing" it is much more satisfying than tapping a reluctant instrument. It is a great confidence builder and keeps your eyes out of the cockpit.

Often you will climb all the way to the top by making beats or "eights", but as soon as you can dominate the mountain, make a few turns. This gives you a well-earned chance to relax (a little), look at the map and decide which mountain to attack next.

Other types of lift

Wave and rotor

With the abundance of mountains and valleys running in all directions, wave can occur in any wind direction. For most of the Alps northerly winds are more favourable than others and winter wave more frequent than summer. Wave can occur in clear blue sky, sometimes rotors are visible sometimes lenticulars, sometimes both. Other times the only visible manifestation is a Foehn gap. One particular situation which surprises a visitor to the southern Alps occurs on the day when he floats around a 300km triangle entirely in wave and discovers on returning that other pilots have done essentially the same task mainly or entirely at lower levels in thermodynamic lift.

Hill lift

Purely dynamic lift is obviously present everywhere, but it usually plays only a small part in cross-countries. It may be the key to a low save.

Convergence

A relief map of any part of the Alps shows at a glance many possibilities for two airmasses, coming from different directions, to meet and give a zone of lift. For example, two valley winds meeting at the divide which marks a climatic barrier, or the valley wind meeting the gradient wind at the head of a valley, may produce large cumulus with a high base and strong lift which lasts all day.

Restitution *(Late thermal sources)*

Many pilots in the Alps fly until nightfall and they discover that restitution takes many forms. Typically it will occur over the lower wooded slopes of the valleys and sometimes in the centre of the valley directly over the river.

Thermals

On days with high cloudbase everyone enjoys getting high and staying high. It is an excellent way to get to know new areas and the view is spectacular. It is not normally, however, the quickest way to complete a task, and on many days it is not possible to fly high above the mountains.

Moving on

In the general direction you wish to go you select a mountain you calculate you can reach at a reasonable height and which, having read my previous article, you think you will have a good chance of working at that height. Suppose that the mountain has a ridge which increases in height from one end to the other, which end do you aim for, the lowest part of the ridge or the summit? All other factors being equal, you go for the part you can dominate, which may be in the middle. If it is working well, you will probably be able to turn towards the summit and climb towards it without circling. If it is not working, you may have to run the other way towards the lower end until you find a zone which is working.

Line of maximum energy

This little exercise illustrates an important general principle. Over the flat country, if you are in a hurry, you are always looking for the line of maximum energy. Of course you are doing exactly the same thing in the Alps. Vertically, this line often turns out to be somewhere between the tops of the mountains and cloudbase, (say) halfway between. In the southern Alps of France it will probably be somewhat lower; at ridge height or even slightly below. Horizontally it will follow the ridge if the mountain is steep-sided, or slightly displaced towards the valley over mountains which have been rounded by erosion.

Although the last paragraph started by drawing a parallel with thermal flying over flat country, you will have noticed a significant departure in selecting the operating altitude. You will no longer be trying to stay within a certain altitude band. You will instead be trying to stay at a certain height relative to the tops of the ridges.

Speed to fly

It is principally the last consideration which will dictate how fast you fly. The first priority is to keep going at the right altitude without circling, and this may mean flying slower than the normal MacCready setting. It may also mean slowing down when crossing wide valleys or snow covered areas, and circling in the last bit of good lift before embarking on the crossing, unless you have heard radio reports of fabulous lift low down on the other side.

Getting low

You have pressed on and the fabulous lift which you anticipated is not *au rendez-vous*. You are now much lower than you would like to be and are approaching the point where the nearest landing field is not more than a 20:1 glide away. You no longer have any choices. The pressing on must stop and you change to survival mode. You will almost certainly not be able to see your field, but you start to move in its direction.

Since you are flying a high performance glider and have allowed for a 20:1 glide, you have a margin. Therefore, you can indulge in the luxury of visiting every likely ridge or thermal-producer en route, no matter how low they may appear compared with the high mountains which now tower menacingly on all sides. If you have already come some distance by thermodynamic lift and if the weather has not significantly changed, you will almost certainly be rewarded by a low save followed by some patient "tree-climbing". If not, the story of your Alpine retrieve will outrank any ordinary retrieve stories in the club bar next winter!

Radio reports

Periodic radio reports in the Alps have two principal functions. First, they keep other pilots informed as to your position – in case you eventually get lost or worse. Secondly, they give information to others coming along behind about the conditions which you have encountered and also any notable hazards. Because it is the practice of many pilots to make such reports, it is essential that they should be brief and if possible follow a standard pattern. Something like:

"Echo Charlie. Leaving the Grand Morgon at 2400m direction St Crepin. The west face of the Morgon was working well at 1700m."

This means that the British pilot should have already done his homework on two simple exercises:

1. Fit either a second altimeter registering metres or a card on the panel giving instant conversions.

2. Learn the names of the principal mountains.

If you insist on working in feet you will be isolated from the rest of the international gliding world, and you will find it necessary to change all the spot heights on your maps into feet. Altitudes are asl, of course – there is no need to say so each time.

Sailplane & Gliding Apr-May 1989