

Joining Thermals and Finishes

There are four important matters to consider when joining a thermal already occupied by one or more gliders, and every single one must receive your full attention.

1. **You must have in sight all of the gliders that are in the thermal**
2. **All the gliders in the thermal must be able to see you**
3. **You must plan your method of arrival and entry to the thermal**
4. **All the gliders in the thermal must understand your plan**

#1 Sighting gliders circling is not easy, and a variety of backgrounds and conditions can conspire to make it even more difficult. Gliders are like kangaroos on the road; where there is one, there will be more, and it is the one you don't see that will do the damage. After you decide that you have them all sighted, then start searching for the one(s) you haven't seen - don't get a fixation on the ones already in view. Keep your scan going over the entire width and depth of the thermal, as one aircraft in a particular stage of the turn may be impossible to see at first glance.

You must also keep in mind that there could be gliders close to you heading for the same thermal. Aim to keep your search going all around, especially above as you will usually be slowing down and gaining altitude as you approach the lift area. **THIS IS NOT A TIME TO BE LOOKING AT YOUR VARIO – ALL EYES OUTSIDE!**

#2 A glider approaching a gaggle at high speed in a straight line will be next to invisible. The frontal area is very small, and we need to increase this and ensure some horizontal movement so that those gliders already established have some chance of seeing us coming. If we are making our own decisions we will want to sample the air as we approach the lift anyway, as it will be best to have an image of the thermal in our own mind. This will lead to some gentle weaving and "feeling" of the air that will make your glider more visible to those ahead. If not, you should attempt to avoid a direct head-on arrival. You should arrive at only a little above thermalling speed, and with consideration of all the established glider's positions so that they have a good chance to see you.

#3 A good concept of spatial awareness is vital in the arrival phase. While still well back from the thermal you need to have a good idea of where you will arrive in amongst the gaggle, in relation to all the gliders. There will need to be a space for you to fit into (!) and if not, you will start a gentle turn outside that

of the gaggle until they have rotated further and you can see room to move in.
DON'T PUSH!

Please, do not arrive at the gaggle at full cruising speed and attempt to pull up amongst them – this is extremely dangerous, as you will have considerable vertical velocity to judge as well as your horizontal position. It will also inevitably mean you are out of sight of one or more gliders, and they are out of sight to you at some stage. If you do this a couple of times someone will punch you in the nose, which will be a very good thing...

#4 As above, you must always manoeuvre in a safe and predictable fashion. Try not to surprise the other pilots with any of your antics. As you fly at higher levels of competition, it is likely that you will have gliders flying at lesser separation, but the pilots generally behave more predictably. If the pilots of the gaggle see you approaching at a sensible speed and behaving as if you are having a good look out the front and working to fit in comfortably, they will be far more receptive and will often open out their turn a little to let you in more easily. Roll into the thermal smoothly and positively, and likewise when leaving keep all the changes of direction predictable.

Keep a good lookout as you leave the climb, especially below as you accelerate. Above all, be careful and courteous.

Open Class Manoeuvrability

Open Class gliders are big, usually 25 metres or more in span, and heavy, often flying somewhere around 800 kg. This means that they have much inertia. They are slow to roll, and take some time to change speed. Their control response is worst at low speed, as when thermalling, and some account of this needs to be taken by other pilots when sharing airspace.

Give these gliders a little more room when you are near them. They will thermal at about the same speed as any heavily ballasted glider, around 55 to 60 knots. Try not to surprise them by doing something unexpected in a thermal, forcing any rapid evasive action. Generally they will not cause you too much trouble; because of their slow and graceful movements you will find their changes of direction quite easy to anticipate, and it is unlikely that they will manoeuvre into a position faster than you can manoeuvre out of it.

Low Energy Finishes

The planning process for arriving back at the airfield should begin many kilometres from home. Too many times the required thought processes only start after the finish line is comfortably under the nose, and often even later than that! There are a number of decision points along the way that need attention, and if these are adhered to then the arrival at the field will result in a good finish, a well executed circuit, safe landing and maybe even a good dose of fun!

To begin with, your task will progress until you find that you have flown onto a final glide path. This is ideally how it should happen, as struggling to get onto final glide early or driving on to low altitude looking for that last booming climb will often both end in lost time. At the point where you find that the numbers are about to add up, you should begin to pay some attention to the impending finish.

Through the day you will have gained a feel for what the air is like, and that may well influence the height that you decide to leave the last climb. If it has been a nice day with good runs and streeting, then you may decide to leave a bit lower than the numbers, and conversely if it has been one of those nasty days with lots of sink around, you will usually take a few hundred feet extra.

Get a feel for how the glide is going as early as you can. If it is going badly and there is no obvious change in the weather up ahead, perhaps you need to stop for some more height. Try not to leave this decision until too late; top up while you are still reasonably high, avoiding a low level grovel. Monitoring progress will allow speeding up or slowing down to use your height most efficiently, and will give an indication of what type of finish will be possible. Lots of spare energy will mean a high-speed finish with a pull up and circuit, and a deteriorating glide might mean a straight-in approach or even consideration of an outlanding.

Firstly consider the high-energy finish. For about the last 20 km you must watch and listen for all traffic. Get a picture in your mind of who the likely conflicts will be, gliders close to your height and distance, or lower and in front and higher behind. Remember that you will all be converging on the finish line and visualise the consequences if you hit one of them! You will have no height to get out. Eyes outside! If all continues to go well and at about 5 km you are still above glide and running comfortably over 100 knots, then a low altitude, high-energy finish will likely result. Think about the wind, landing direction and keep looking for traffic. From 5 km onwards you have no further need to look inside the cockpit, at all...

The height that you decide to go over the line will depend on experience, traffic, wind, obstacles and the rules. Very low and very fast is fun, and usually quite safe, SO LONG AS YOU HAVE ALL THE ABOVE POINTS ON YOUR SIDE. Traffic will dictate extra height or maybe moving to one side. Wind will make it uncomfortable and more dangerous to be right on the deck. There will always be some trees, power lines, fences or buildings near to your approach path, and some of these are difficult to see at speed and in particular lighting. Know the airfield before you go low. And the rules may impose severe penalties for being too low – that will also spoil your day.

Having crossed the line you must make all changes in direction and height as gentle and predictable as possible. There is no point in pulling up sharply to circuit height, then doing the rest at 50 knots. It is far safer to gradually bleed off the speed at just a few hundred feet and arrive on finals just as you get down to your approach speed. This takes practice, but will come with time. Watch, watch, watch for traffic, don't forget your checks in all the excitement and keep an eye on the landing area to ensure that it isn't becoming congested. An airfield is usually pretty big, and a bit of a walk to your car is less painful than hitting something.

Now, the low energy finish is the one that can bring you undone. Usually at some distance out it will become clear that you do not have the required energy for a high-speed finish, or alternatively the glide will all turn to worms in the last 10 km. The latter scenario requires strict attention and a degree of flexibility in your planning. If you never had enough energy then your planning is always to consider a straight-in landing, with the only other decision being to outland if the glide deteriorates. However, if all goes well till quite late, you may need to quickly change plans backwards from circuit to no circuit, and maybe even to outlanding.

There is a critical time about 5km from home when you must decide that indeed you do have enough height to get home safely, or you must land right here. After you pass that point, you will no longer have enough height to correctly choose and land in a paddock. Once again experience, wind and paddock choices will dictate how low you may choose to continue, but don't fall victim to the "get-home-itis" danger. A safe outlanding means you can try again tomorrow.

All the same comments about traffic and forward planning apply here. Once you descend into that height band below about 500 feet, great care is needed to maintain a safe speed, especially if you are stretching the glide to the

maximum. As said earlier, from now on your best instrument is looking out the front. If there is any appreciable wind take extra care and add a few more knots. If the wind is on your tail the view out the front may be pretty daunting with a very flat angle and the prospect of a downwind landing. If you are low and slow then take this option, as trying to turn at low level could kill you. A downwind landing is a far safer bet, so long as you are prepared for early loss of aileron control. Stalling, spinning or digging a wingtip into the ground is very untidy... DON'T STRETCH THE LIMITS!

If you have the wind on your nose the whole process will be easier. You will be looking at a steeper angle to the field and an into-wind landing will usually be more straightforward. Same comment applies about turning close to the ground, and there is actually a case against steeper turns into wind at very low altitude. The wind gradient can mean that the lower wing can have significantly less airspeed, to the point of not being able to roll out of the turn. Keep turns moderate. Do your checks, as the stress of a long, marginal glide can so often lead to a spectacular belly-flop!

A young pilot I know always works with the motto: Airspeed, altitude and brains – you always need at least two. Sound advice!

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