

# AIRMANSHIP

## Introduction

Airmanship can be defined as good decision-making, good manners, situational awareness, defensive flying and applying common sense. This chapter describes some of the related rules and procedures around Lasham.

## Look-out

The airspace around Lasham is very busy. Mid-air collisions are the greatest hazard in gliding. Please keep a sharp look-out at all times.

The most likely places that you will encounter another aircraft at the same height are when you are on the circuit into an airfield and when you are in a local thermal, so vigilance should be greatest here. However, you should also appreciate that the risks of collision continue when flying cross-country. This is because gliders do not spread out evenly, but will congregate in good lift, under cloud streets, near turning points, at other airfields and where the airspace channels them.

The risk of collision not only arises from other gliders, but from other users of airspace. These are usually light aircraft, who sometimes fly across the airfield because they are unaware of the level of traffic in the area.

Many power-pilots incorrectly assume that they will be warned by radio of conflicting traffic. Their aircraft will also maintain the desired height and course with very little intervention. Consequently some power-pilots may spend less time looking out than glider pilots. In addition, gliders have small cross-sections and are easy to miss. Glider pilots have to compensate for this by even greater vigilance.

Fortunately the sky has a large volume and random separation usually works, but this is not a guarantee. The greatest protection is provided by keeping a good look-out, not flying in another glider's blind-spot and by staying well clear of cloud.

## Vision and look-out

The detail that we see across our field of view varies because of the structure of the retina at the back of the eye. This can be divided into three areas:

- A small oval shape (the fovea) that subtends only about 3° comprised of receptors called cones, where we see detail in colour
- A secondary area comprising a mix of cones and other receptors called rods with worse resolution
- A third area of peripheral vision comprising only of rods, which are mainly sensitive to sudden movement.

Rods are not as sensitive to colour. Consequently vision is increasingly monochromatic as images move away from the central fovea. We can only resolve any detail in a very small arc of vision. (Try fixating a word in the middle of the page and then recognizing adjacent words.)

Each eye also has a blind spot where the optic nerve connects to the retina. An object that is focused just on a blind spot will not be seen by that eye. Normally you use two eyes, but if anything obstructs one eye, such as the canopy frame, the other eye can miss things.

Be aware that when a pilot is operating with an empty field of view such as blue sky, the eyes will tend to focus at a point 1 to 2 metres away. You must actively look for objects on which to focus, such as the horizon, or even just the wingtips.

### How to look out

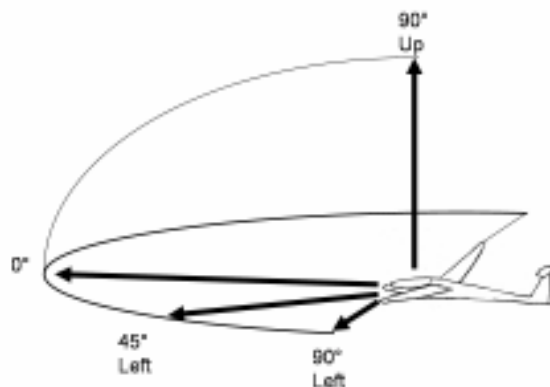
An effective technique for looking-out is a habit that must be learned. Even if you are looking out most of the time, it is still easy to miss other traffic, unless you look systematically.

It is easy to become fixated on just one thing instead of looking out all around regularly. This object could be just one of the gliders in your thermal, the instruments, the map, your lunch or something on the ground. By concentrating on just one object, you can easily miss another aircraft nearby.

As mentioned already, our field of view can be divided into three areas: a small oval shape where we see detail, a second area with worse resolution and a third area of peripheral vision, which is mainly sensitive to sudden movement. (The 3° of primary vision is not much larger than the area of a full-sized altimeter on the instrument panel as seen from the pilot's seat.)

Even the secondary area is inadequate to notice a small but rapidly closing object. You must, therefore, methodically fix your gaze in each direction to use your primary vision. Do not just swivel your head about without pausing.

Try to maintain a steady rate of scanning throughout the flight rather than ten minutes of extreme scanning followed by very little.



*Half the scan cycle. At each point in the horizontal cycle, look above and below the horizon.*

Look ahead, then horizontally to the side at 45° and then at 90°, or more if possible. At each of the horizontal points, also look above and below the horizon. Look overhead, and then check the attitude and perhaps the instruments, before checking the other side of the glider. This cycle should be repeated as often as possible.

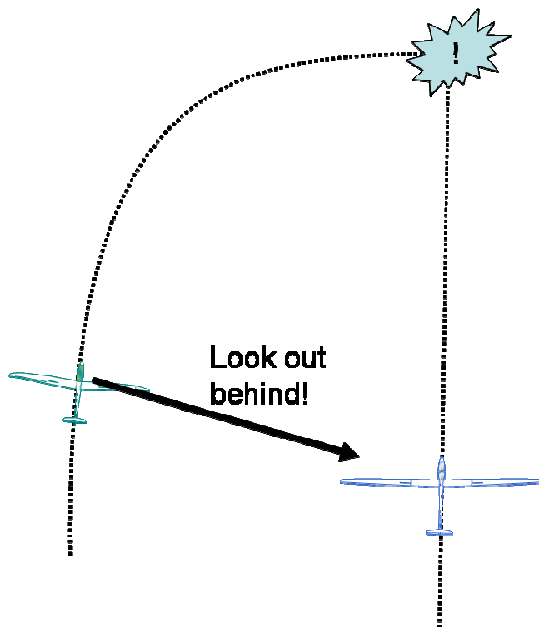
Note that the greatest risk comes from other aircraft that are at the same height. They will therefore be on or near the horizon, and may be difficult to spot against this background. In mountains the irregular background can reduce the contrast of another aircraft's image even more.

If an object does not seem to move across your field of view, it is on a collision course. There is a saying "Constant bearing = constant danger".

Displaying a poor look-out is a certain way to fail a check-flight. You will not be allowed to fly solo again until a good look-out habit has been learned.

### Looking before turning

Look in the direction of the turn and back over the nose before turning. Once turning, keep checking inside the turn.



In the diagram above, the right-hand glider might be even further behind and so would be invisible from the left hand glider, until the pilot started the turn. A continuous look-out during the turn is therefore essential.

### Looking out in thermals

Special considerations apply when thermalling with other gliders. Not only should you monitor all the gliders in the thermal, you must also continuously check that no-one else is about to join or fly through the thermal.

Gliders should circle in the same direction in a thermal, and gliders already established in the thermal have the right of way. If someone joins your thermal at a similar height and circles in the opposite direction, they probably have not seen you. Even if you found the thermal first, change direction to prevent a conflict or, if necessary, leave the thermal.

Join thermals at a tangent to the circles of the existing gliders, ensuring that the gliders already turning are not forced to make a manoeuvre to avoid you.

Pilots should keep to the principle of 'see and be seen'. Wherever the lift may be, your first responsibility is to keep the other gliders where you can see them AND where they can see you. You must be able to keep track of all gliders in your vicinity.

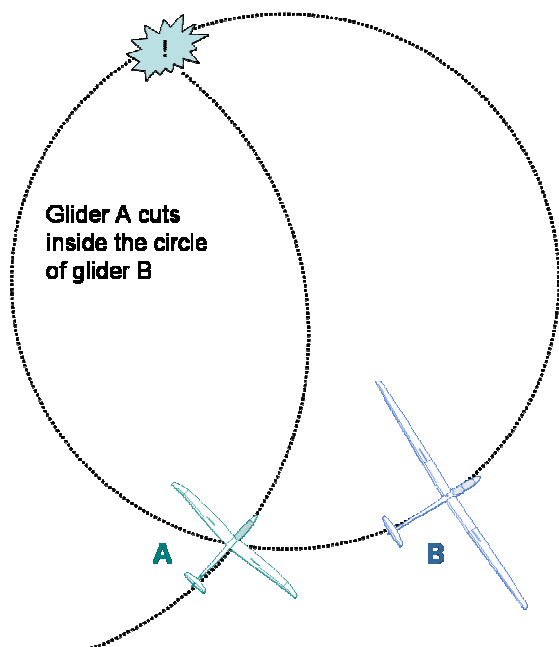
Waving at the other pilot in a shared thermal is not only friendly, but confirms to the other pilots that you have seen them.

If you lose sight of another glider in a thermal, leave the thermal. Look around especially outside the turn before straightening up. You must get clear of other gliders, however low you are, or however good the thermal is. It is just not worth risking a collision.

If you are thermalling at the same height, stay on opposite side of the circle, even if the other pilot has not, in your opinion, fully appreciated where to find the best lift. If you start chasing another glider's tail, the other pilot has lost sight of you, and is probably cursing you. This may mean that you have to adjust your speed, or to adjust your rate of turn to match that of the other glider.

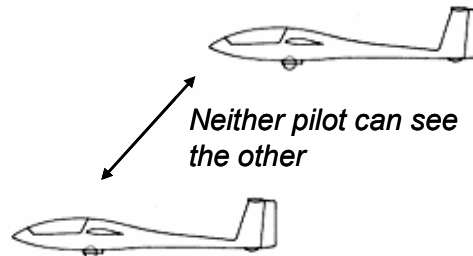
Other points to bear in mind in a thermal are:

- Never turn inside the circle of another glider
- Never fly towards or ahead of another glider
- Never fly directly below another glider. They could dive to pick up speed or even spin. You should not fly under another thermalling glider unless there is at least 200 feet of clearance
- Never fly in a blind-spot. For example, a position that is almost alongside would give you little chance, were the other glider to turn suddenly.



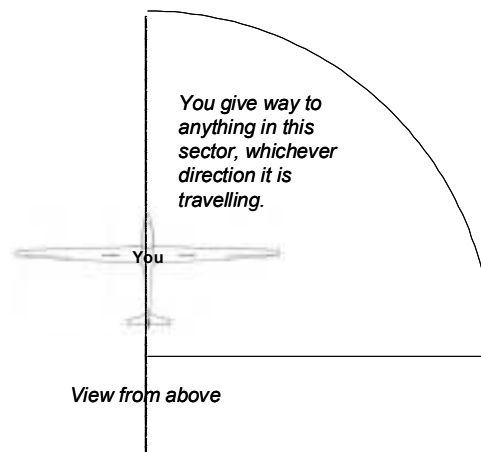
Some thermals have two cores so that you might find that the circles of two gliders intersect. This is highly dangerous. It would be much safer if you matched your circles in the same core. Ideally the glider that is being out-climbed should give way and change its circle but the other pilot should not assume that this will occur. Both pilots should take action to prevent their circles from overlapping

It is dangerous to fly straight at the centre of a thermal even if the other gliders appear to be well below. This is because you must pass through sinking air while the other gliders may be climbing strongly. It also does not give the other glider's time to notice your presence.



A big risk occurs when one glider is flying slightly above and behind another. Neither can see each other. The upper glider cannot see through the floor and the lower glider cannot see behind. Be aware when 'dolphining' that another glider can be in this position.

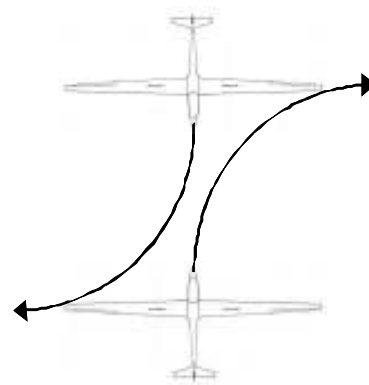
### Right of way when converging



The rule on converging aircraft is simply expressed as: if you see an aircraft on your right-hand side, give way to it. Alternatively you can say 'If it's on your right, it is in the right.'

### Head-on

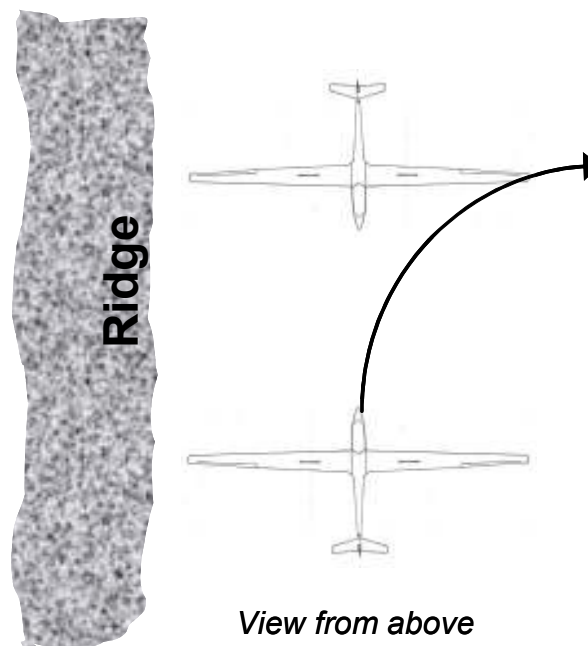
The rule for head-on aircraft is that both should turn to the right (in plenty of time, unlike the diagram below). In general any avoiding turn should be to the right if possible, unless, of course, it increases the risk.



*View from above*

The fastest way to get a safe distance between you and the other aircraft is to move vertically, ie dive or climb, but this assumes that the other aircraft does not do the same, so a turn away is also needed

### Hill soaring



*View from above*

When flying near hills and mountains, all turns must be made away from the hill. On a ridge the same rule about head-on aircraft also applies, except that one aircraft may be unable to comply without colliding with the terrain. Any glider on a beat with the hill on its left has a particular responsibility to keep a good look out, and to give way in plenty of time.

Since a glider may turn away from the hill at any time, you should only overtake another glider on a hill by flying between the glider and the hill.

Because they may have to give way, gliders flying with the ridge on their left should fly further out from the ridge than those with the ridge on their right.

### **Overtaking**

Away from the hills, an overtaking aircraft should keep out of the way of the slower aircraft. In the UK gliders can pass either side of each other, whereas powered aircraft only overtake on the right.

### **Landing**

If two gliders are landing together, the lower aircraft has precedence, but may not cut in front of another which is on final approach, nor overtake it. If you are aware that the other aircraft is making an emergency landing, you must give way to it.

### **Balloons**

Gliders shall give way to balloons.

### **Following landmarks**

If you are following a road, railway, the coast or another linear landmark, you should keep right, so that the landmark is on your left. (British roads and railways tend not to be straight for very long and so compliance by gliders is uncommon.)

### **On the ground**

Do not land at Lasham less than two wingspans away from edge of the landing area. After touching down, check that you have a functioning wheel-brake before turning to clear the landing area. Only if you are sure that it is clear, can you turn during the ground run. In particular you have to consider the possibility that a glider may break the two wing-spans rule and land between you and the edge of the landing area.

The rules of the air state that if you are overtaking another aircraft on the ground, you should land to the right of it. However this does not allow you to land less than two wing-spans out from the edge of the landing area.

If landing near another glider that is still moving after touch-down, it is safer to land shorter or well beyond the other glider's probable track to reduce the risk of the glider taxiing to the side.

### **Even if you have right of way**

There is little satisfaction to be had after a collision; even if you point out that you had the right of way. You can never assume that you have been seen, and you should always be prepared to take avoiding action.

**Take the safe option**

There are a myriad of situations where you can choose between a risky and a safe option, and it is not proposed to list them all here. The choice that you make may not be the direct cause of an accident, but may be part of the chain of events.

For example, you are flying downwind in a circuit with a much higher performance glider in front which is at about the same height. This glider will probably fly downwind further than you would want. You could wait until you get too low, or you could take the safe option of turning in early and landing further up the field to avoid a potential conflict.

In another example, you as launch point controller decide to squeeze in another launch when you become aware of a glider already on a low circuit. The low circuit may already be the first factor in the accident chain. The obstruction of part of the airfield by the launch may then become the second part of the chain. Perhaps just one or two more factors can then occur which will overload the landing pilot, and an accident may ensue.

You are uncertain whether the fault in a glider makes it serviceable. It looks minor. The thermals are already booming and you think that the fault will probably not be a problem, especially since the previous flight was normal. However, you have a small doubt. You should already know the answer to this dilemma. If in doubt, take the safe option. Remember that taking-off is optional but landing is compulsory.