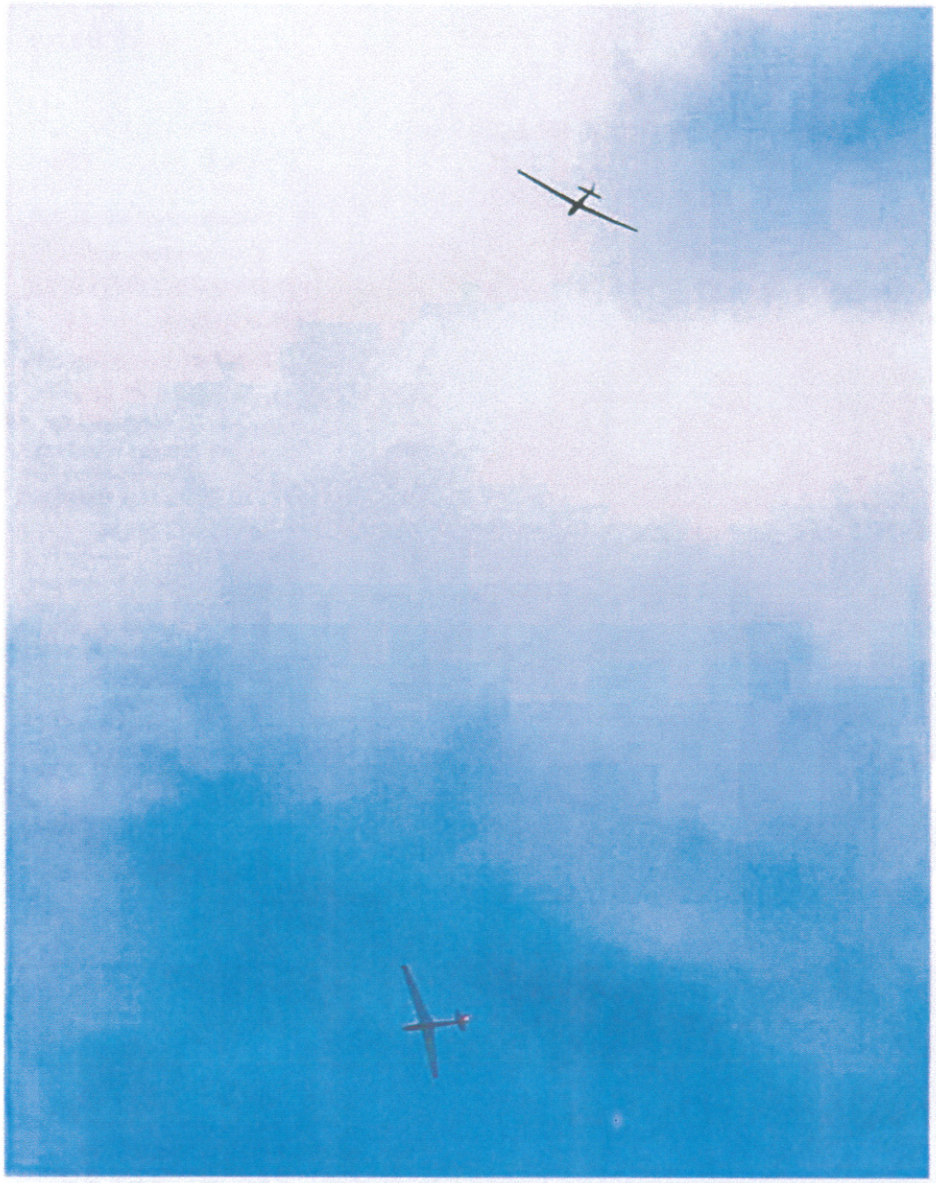


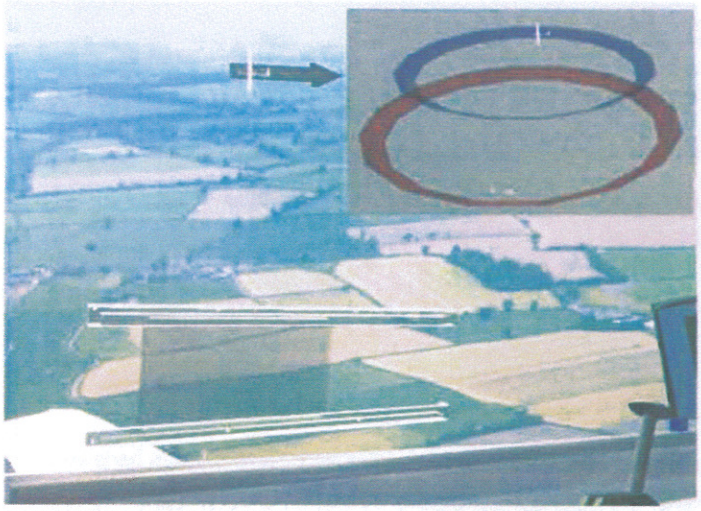
Two K-13s share a thermal near Lasham in Hampshire *the **White Planes** picture co.*

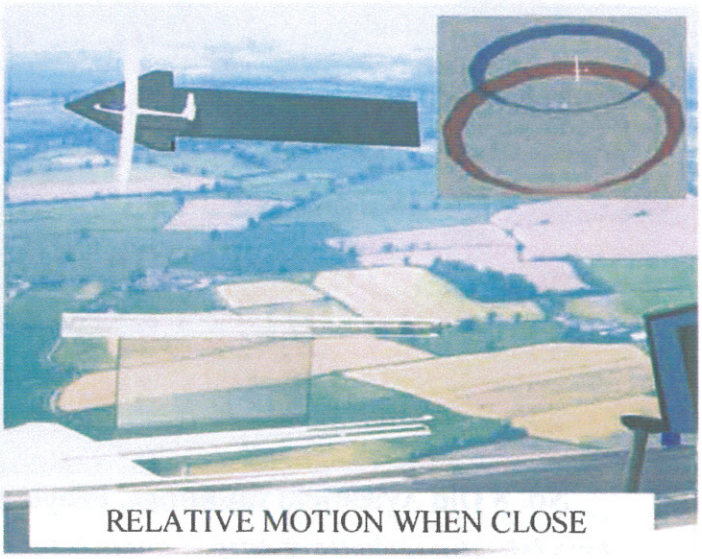
How to share a thermal

Having advised on joining lift in the first article of his three-part series on thermalling, BGA National Coach Simon Adlard offers tips on keeping station in a thermal with other gliders

ONCE WE have joined our thermal opposite another glider (as described in *How to join thermals*, June-July 2002, p22) and are managing to keep it roughly opposite us, one of the first things that we need to assess is whether our turn radius is centred on that of the other glider's. If we have managed to do this successfully then the other glider should the same distance from us all the way around the turn. If, however, our turn axis is displaced from that of the other glider's then not only will the separation of the two gliders alter but also the relative position of the other glider in the canopy will move back and forth (*figures 1a and 1b, below*).

This in itself is not inherently dangerous, unless the centres of the turns become further displaced, to the point that the overlap of the turns leads to the two gliders becoming unacceptably close. In order to rectify this situation, you will need to





Figures 1a (left) and 1b (right): when the turns are based on separate axes the other glider will be seen to move fore and aft as well as to alter its distance from you

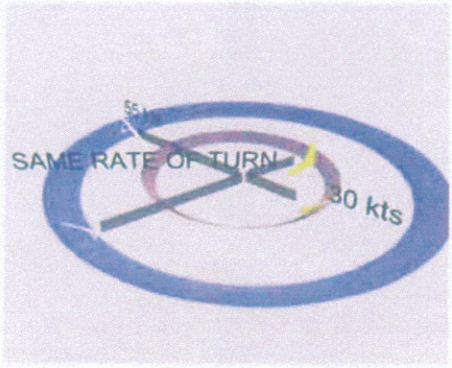


Figure 2, left: two different types of aircraft can thermal together provided the speed and bank angle are adjusted to give the same rate of turn

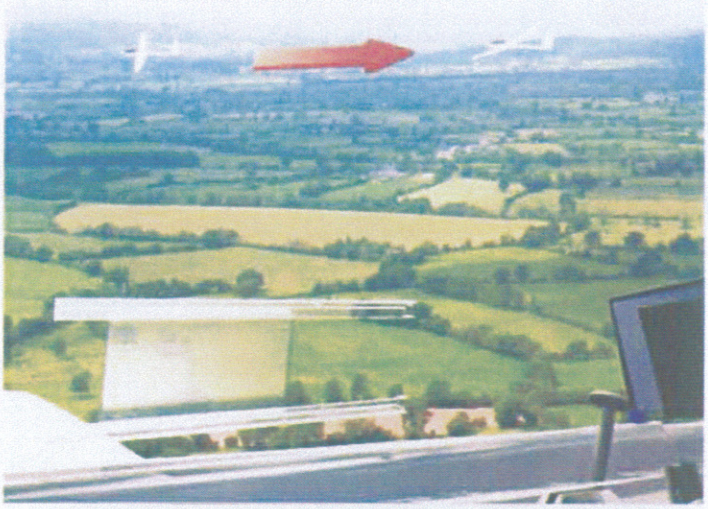
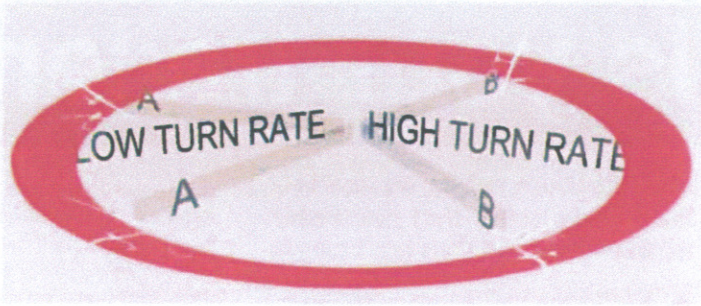


Figure 3, right: to correct this situation our bank angle should be reduced to slow our turn rate

The relative movement of the other glider is backwards when your turn rate is too high



Diagrams: Simon Adlard

displace your turn towards the others by opening out and increasing speed when the other glider is at the furthest point from you, and then tightening and slowing again when you believe your turn axes are similar.

Once we think that we are turning on a similar axis to the other glider the name of the game is to keep it there. In order to do this, it is important first of all to understand the concept of rates of turn.

Our rate of turn is the number of degrees turned per second, and depends on several factors. The two factors that we have control over are speed and bank angle. For a given angle of bank the only way to increase our rate of turn is to slow down, and similarly for a given speed increasing our bank angle will also increase our rate of turn. Both of these will reduce our turn radius and so our distance from the other glider should be reduced.

This is all well and good; however, we need now to remember that a glider will have a minimum radius of turn. Consider a hang-glider thermalling at 45° of bank at 30kt. This is now joined by a Discus. In order for the Discus to have the same radius and rate of turn it will also need to bank at 45° and 38kt. Clearly, this is impossible. If now the Discus flies at 55kt and 50° of bank the radius of turn will be greater but the rate of turn will be similar (*figure 2, above left*).

Using these principles, we can develop a system that can help us to maintain station with another glider by using relative movements of the other glider in the canopy.

Let us assume that we have joined another glider in a thermal and have now matched our bank angle to its bank angle; unfortunately, though, our rate of turn is higher. From our perspective this can be recognised due to the fact that the other glider is now starting to move round towards the nose of our glider (*figure 3, above*). In order to put this right we must reduce our rate of turn. To do this we can simply reduce our bank angle until the other glider is opposite us and then slightly increase our bank angle again in order to hold it there.

In a similar manner, if the other glider starts to move behind us then it means our rate of turn is too small, so an increase in bank angle is required. This will then increase our turn rate and bring the other glider opposite us.

This works up to a point, but remember the case of the Discus and the hang-glider. You may find yourself continually tightening trying to stay opposite until you find yourself at a ridiculous angle of bank with pre-stall buffet. If this is the case then you should try to move further away from the other glider and try again, even if this means peeling off and rejoining.

Once again, sharing a thermal can be made less fraught provided a simple set of rules is followed (*The Rules (3), below left*).

The last and probably the most important aspect of thermalling with other gliders is being constantly aware of what is going on around you. I have described station-keeping by monitoring the other glider; however, it is also important to look around for any other aircraft that may be coming to join the thermal or – indeed – that are about to fly straight through it.

If other gliders do come and join you then try to manoeuvre so that all the gliders at one level are equally spaced, and maintain station with them using the same technique as with one glider. It is quite possible that four or five gliders may end up thermalling at the same level, in which case you may well find yourself flying behind another glider (but still in a position where the lead glider can still see you). If this is the case then still try to keep station using the normal method but be aware that it is important to match your speed with that of the glider in front: remember, if its apparent size is increasing then you are catching it up!

There may come a time when despite your best efforts the number of gliders thermalling with you exceeds your ability to either keep track of or, even worse, see them, and this will be when your best course of action will be to leave.

Next issue: Simon's third and last article describes how to depart from a thermal

THE RULES (3)

1) Always be aware of what is happening around you.

2) Make sure you can see the other gliders and they can see you.

3) Look out for other gliders joining or flying through the thermal.

4) Do not turn inside another glider unless you can maintain adequate separation even if they tighten their turn.

5) Leave the thermal if the other gliders are getting too close or too much of your attention is used up watching the other gliders.

6) Do not pull up or dive sharply in the thermal.