



## Soaring by Design

### *Avoiding Collisions*

**Narrator:**

Sometimes a glider needs to alter course rapidly. One such occasion is when a potential collision is possible. The rule is that a pilot must give way to another aircraft approaching from the right. Whilst a glider can't necessarily gain height at will, it can always dive to pass a safe distance below. To gauge height a pilot has an altimeter – in this case the glider is flying at 650 metres – and an airspeed indicator – this is a typical flying speed of around 95 kph. The height and the speed are intimately linked and since the airspeed indicator is more sensitive and responsive than the altimeter, it's useful to think of the manoeuvre as a change in speed, with height change as the consequence. Watch what happens to both speed and altitude when the glider dives down and up. In fact that dive was rather greater than would be strictly necessary when taking avoiding action but it dramatically demonstrates the connection between the two parameters. Look at the mechanical energy involved. In flight the glider has Kinetic Energy because it's moving, and Potential Energy due to its height above the ground. The sum of these, the Total Energy, slowly decreases as the glider continuously descends. However, over short periods, the energy loss will be small and we can assume that the Total Energy remains constant. As the aircraft dives the Kinetic Energy rises at the expense of the Potential Energy. On bottoming out the speed has more than doubled and the Kinetic Energy has more than quadrupled. Back at the normal flying speed almost all the height has been regained and so the Kinetic Energy gained has been converted back into Potential Energy.