

APPROACH AND LANDING

A good landing usually follows a well-controlled approach.

The Approach

There are two parts to controlling the approach;

- 1) judging whether the glider is overshooting or undershooting by observing the apparent movement of the **Reference Point** (RP – more later) in relation to the canopy, and making any corrections necessary
- 2) judging the steepness or shallowness of the approach and deciding how (or if) to correct it to the optimum airbrake approach.

Before formally introducing this exercise, your instructor will check that you have;

- good elevator, aileron and rudder coordination
- good speed control
- good directional control, particularly in straight lines
- completed the 'Effects of Airbrakes' exercises

During the student pilots attempts at flying the approach, the instructor will never be far from the controls. He or she is required to take control if there is any doubt. So please don't feel hurt if just as in your view you nearly had everything under control, the instructor took control and completed the landing. You'll learn from the debrief and improve next time.

Approaching towards a relatively featureless surface such as grass or tarmac can be awkward. To make things easier, a Reference Point (RP) can be chosen from the low key area (see 'The Circuit') in relation to some definite object on or near the landing area. Once on the approach don't be drawn to fly directly towards the object! In practice, when the RP is chosen from the low key area it is more of a reference *area*; the level of ground detail isn't usually sufficient for it to be anything else. It becomes a reference 'point' when the glider is on the approach.

The approach speed is usually considered before take-off. Your instructor will teach you how to calculate an appropriate approach speed and teach you how to maintain that speed throughout the approach.

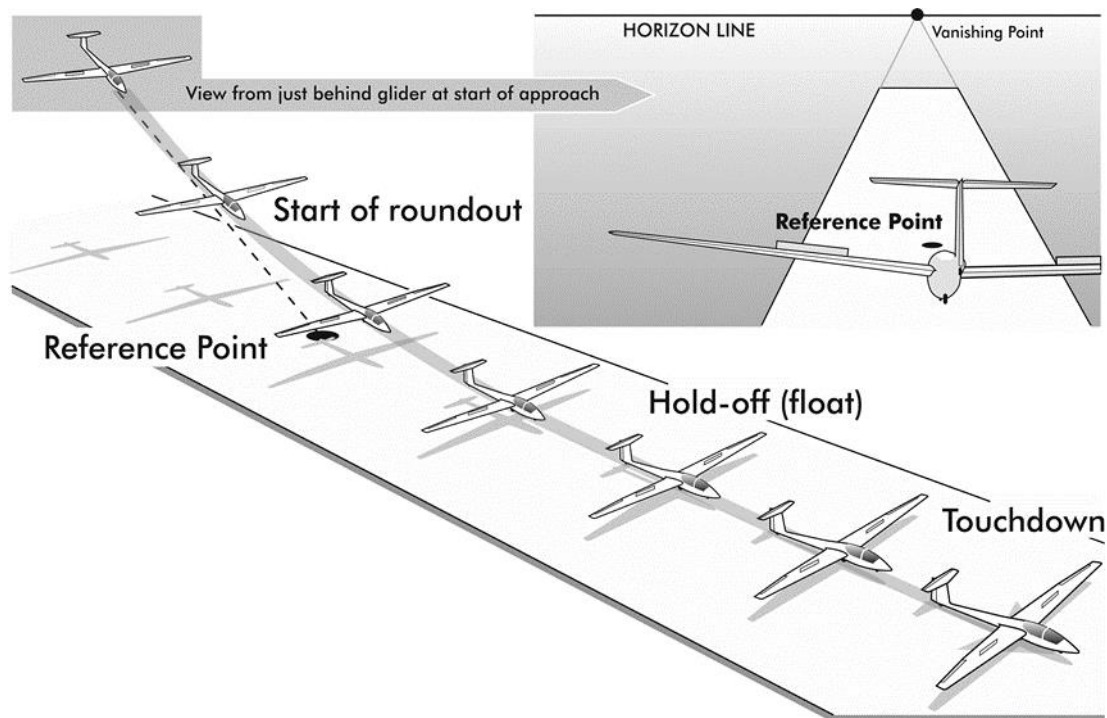
Movement of the RP up or down the canopy shows how the glider is moving in relation to a path targeted on the reference point. It doesn't indicate whether the glider has started the approach high or low.

The descent path is controlled by the airbrakes. The approach speed is controlled by the elevator, with reference to the attitude and the ASI. It may be necessary to change the amount of airbrake, e.g. reducing it through a wind gradient (ie where the wind strength and/or direction changes markedly over a relatively small height difference).

If the RP appears to move down in relation to the canopy then the glider is overshooting, but this is only true if the attitude and speed are constant. If the RP appears to move up in relation to the canopy then the glider is undershooting, and again this is only true if the attitude and speed are constant. Your instructor will emphasise how important attitude and speed control are during the approach.

If the RP appears stationary in relation to the canopy and both the attitude and the speed remain constant, then the glider is approaching the RP correctly. In theory, the ideal descent path is with approximately two-thirds airbrake selected as this allows a good margin for recovering from an undershoot.

As the glider nears the **round-out** point, ie. the point at which we start to raise the nose for the landing, transfer attention further ahead in order to obtain the needed visual clues to land the glider. Keep checking that the speed remains safe. Any unwanted loss of speed near the ground requires either a reduction in the amount of airbrake, or their closure. Your instructor will be VERY close to the controls when you are flying near the ground.



Approach and landing illustration from the BGA Instructor Manual

The Landing

The landing can be divided broadly into two stages;

- the **round-out** and **hold-off** (or float), and
- the **touchdown** and ground run

Please note that is more important initially that you land the glider well, rather than land in the right spot precisely every time. As you gain practice and skill, you'll find yourself landing closer and closer to the part of the landing area you expected and planned to stop at.

Round out and hold off

In a fully held-off landing the glider's tail wheel touches the ground fractionally before the main wheel. The stick will be fully back and the glider is effectively stalled. A fully held-off landing gives the slowest possible touch down speed. If the glider hits a bump, it won't take-off again, and any impact with embedded stones, holes in the ground etc, will be lessened.

You will be taught that the object of the 'float' phase is to keep the glider flying just above the ground for as long as possible. As the speed decays the glider will inevitably sink and the stick will need to be brought further and further back to prevent this. Eventually the glider will 'land itself'. There is no need to actively 'land' the glider, but don't extend the float by reducing the airbrake setting. Keep looking ahead during the round out and hold off as this will help you judge the gliders attitude. Don't be tempted to turn your head to look at things on the ground as you fly past!

Touchdown and ground run

Once the glider has touched down, its usually best to open the airbrakes fully (but careful not to allow the wheel-brake to come on – see below) and bring the stick progressively back to the stop if it is not there already. This will:

- prevent the glider from taking-off again
- prevent damage to the nose wheel or skid
- initially, slow the glider more quickly
- help a glider with a tailwheel to keep running straight

Throughout the ground run the wings must be kept level with the ailerons, and the glider kept straight using the rudder. As the speed decays, larger and larger control movements will be required to keep the wings level and/or steer the glider. This is an occasion where independent use of the ailerons and rudder may be necessary.

If the glider has a wheel brake, it can be used with care. It is easy to use too much wheel brake and cause the glider to skid. In most gliders the wheel-brake is activated at the end of the airbrake lever's travel, so please be careful about landing with the airbrake lever fully back and thus operating the wheel brake.

Some student pilots are so relieved at making a reasonable landing that they relax rather than staying focussed and in control until the glider stops moving. Once the glider has come to rest you can relax and give yourself a virtual pat on the back!