Time for lateral thinking

A recent incident has prompted Don Puttcock to devote some serious thought to the first few seconds of the winch launch.

This article addresses the issue of wing drop during the ground run of a winch launch. It aims to produce a compelling argument for the pilot having his or her hand on the release knob during the ground run of the launch.

It is commonplace to see pilots picking up a dropped wing and continuing the launch, with apparently very little risk. To them it may seem a contradiction that in some countries, for instance, aerotow launches may even start with a wing down.

How is it that a wing touching the ground is so hazardous, and yet we see them picked up routinely with no apparent difficulty?

C of G couple

During the initial ground run, a tendency for the nose to pitch up is created by the couple between the cable pull and the relationship between the hook and the centre of gravity (C of G) – see Figure 1.

Gliders that start the launch with the front skid on the ground (for example, the K-13), are prone to slam the tail against the ground if the winch driver snatches the glider by delivering power too quickly. The reader should reflect how quickly the tail hits the ground in this situation. The elevator has no authority at this stage and the pilot is powerless to stop the tail hitting the ground.

What is less well known is the lateral C of G couple. This couple tends to roll the glider (see Figure 2).

Wet or low-friction surface conditions will make matters worse; this reduces the grip of the tyre, and allows the wheel to drag sideways. Any situation that causes the glider to be out of alignment with the line between the winch and the glider will allow a turn to commence.

When the misalignment is increased, the lateral C of G couple is correspondingly increased (see Figure 3).

After the wing touches the ground, the turn continues and the rolling forces increase. What follows is a take off with sideslip (see Figure 4). As the wing takes the load, the tyre grip reduces and the wheel begins to slide sideways. The turn and rolling continues until the centre of gravity and the hook are aligned (see Figure 5).

If the glider is allowed to climb a mere half wingspan, just a matter of seconds, it will probably cartwheel.

When it happens there is insufficient time to reach for the release and pull it.

This is not a good time to be fumbling for the release knob.