

Date: 9/23/98

From: MSC Instructors

To: MSC members interested in flying the Junior

Requirements for flying the Junior

Before a MSC member may fly the Junior they must meet or exceed all the following requirements:

- Have a private glider rating or better;
- have flown at least 50 hours and had 100 flights in gliders;
- been previously checked out in all other MSC gliders;
- have another checkout in the owl (unless experienced in equal or greater performance gliders);
- read and sign the information sheet on flying a taildragger¹;
- be signed off to fly the Junior by an MSC instructor; and
- at the discretion of that MSC instructor, meet any additional requirements.

1 - The information sheet will be in a folder at the FOO table.

Directional stability and control on the ground

The position of the main wheel in relation to the centre of gravity has a considerable influence on the control and stability of the aircraft while it is running on the ground. This is because the aircraft then pivots about the wheel instead of, as in flight, about the C of G. On most modern gliders the weathercocking effect is extra powerful, because with the forward position of the wheel there is much more side area behind the wheel than behind the C of G. On the K8, K13 and other gliders fitted with a forward main skid, there is less side area behind the wheel and directional stability on the ground is less good.

In strong crosswinds an aircraft with the wheel ahead of the C of G will have a very much stronger tendency to swing into wind and the rudder will be less effective at stopping it. This is a very real problem with modern gliders.

If the friction between the ground and the tail wheel or skid is sufficient to prevent a swing, a normal straight take off or landing run will be possible. However, if the friction is low, the pilot will be unable to prevent a swing into wind while the glider is still at low speed and rudder control is not yet effective..

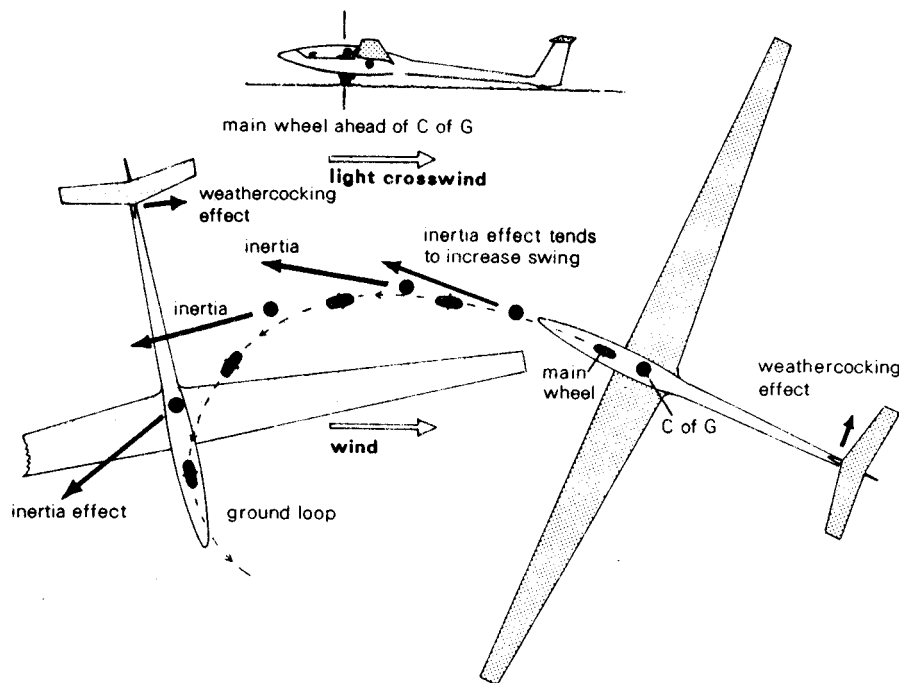


Figure 1 - The inertia effect tends to accentuate any swing when the main wheel is ahead of the C of G as in modern gliders. In light winds the inertia effect becomes more powerful than the weathercocking effect.

Extra caution is needed with gliders or powered aircraft operating from smooth, hard surfaces like tarmac runways. If they have a tail skid instead of a tail wheel there will be very little resistance to swinging and at low speeds the pilot will be unable to stop a swing into wind. On grass or softer ground it may be a help to keep the tail down at low speeds. A backward movement on the stick will increase the friction and the resistance to the tail skid moving sideways over the ground.

In no wind conditions it might be expected that the longer moment arm of the rudder on an aircraft with the wheel ahead of the C of G would give better directional control. However, there is one vital factor which cancels out this apparent advantage. When the wheel is ahead of the C of G the inertia of the aircraft also accentuates any swing (figure 1). In windy weather this is unimportant because of the powerful weathercocking effect. In light winds, and particularly in light crosswinds, once the glider has started to swing badly the inertia will keep the swing going and a ground loop will be inevitable.

When the main wheel is behind the C of G the inertia tends to keep the aircraft straight and serious swings or ground loops will not occur, unless the wingtip touches the ground and causes the swing (figure 2).

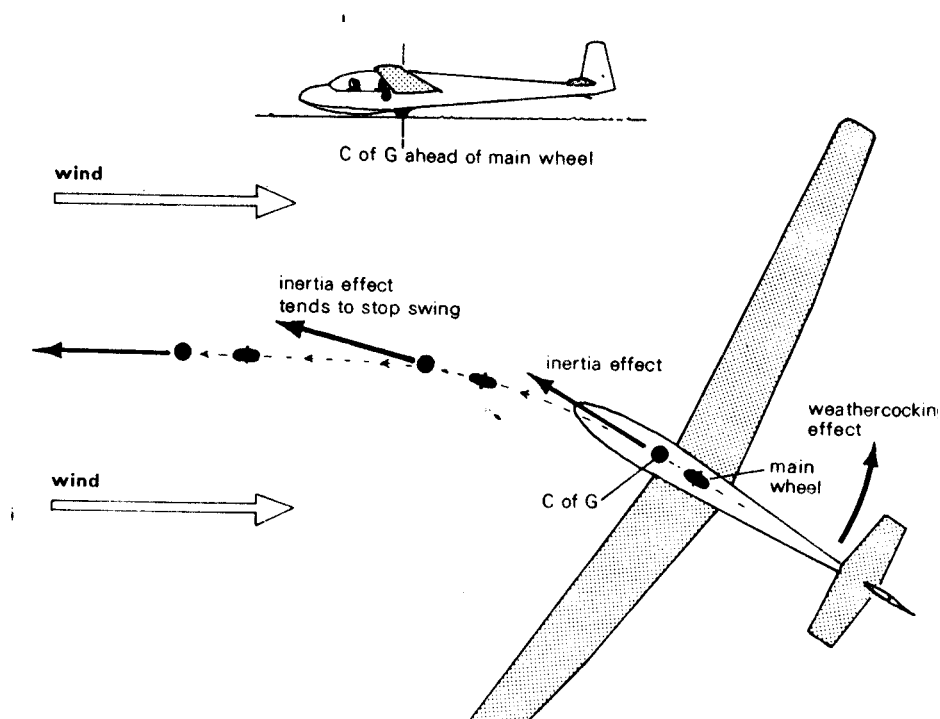


Figure 2 - Weathercocking effect with main wheel behind the C of G. Inertia effect tends to reduce the swing on the ground run.

This problem is accentuated by the higher landing and take off speeds of many modern gliders and by their rather ineffective aileron control at low inertia speed. This makes it much more likely for a wingtip to touch the ground or catch in long grass and start a swing. In these aircraft it is safest during take off to have the wingtip holder on the downwind wing so that, if he drags the wingtip at all, he is swinging the glider out of wind. Otherwise he may cause an uncontrollable swing and the take off may have to be abandoned.

The golden rule on take off is to allow extra room in case it proves impossible to keep straight. It is always wise on a crosswind take off to anticipate a possible swing by starting the run with full rudder to prevent the glider swinging into wind, and then reduce it as the speed increases and the controls become more effective.