

**What is “Laminar Flow”?**

Laminar flow is the smooth, streamlined flow of air over the glider’s surface that gives low drag characteristics / values; as opposed to turbulent or separated flow that has high drag values.

**A glider always stalls at the same..... what?**

Angle of attack...known as the critical angle.

**How do you differentiate a spiral dive from a spin?**

In a spiral dive, speed will be increasing, in a spin it remains low; the controls will feel heavier due to the increasing speed in the spiral, in the spin, they remain light; G will be increasing in the spiral, in the spin it will remain around 1G.

**What is “lateral damping”?**

This is the tendency of the wing to resist movement in roll, caused by the increased angle of attack generating more lift on the down going wing.

**How much control can you use at Maximum Rough Air Speed (V<sub>a</sub>)?**

Full control...but common sense says be kind to your glider and only use as much as you have to!

**Define “Wing Loading” and why is it significant?**

The gliders weight divided by the wing area. Low wing loading gives a low speed handling advantage and good climb performance in weak conditions while high wing loading gives good high speed performance as this increases the speed for the best gliding angle. Wing loading is varied by carriage of ballast or a flap system that changes wing area or effective lift coefficients.

**How does True Air Speed (TAS) differ from Indicated Air Speed (IAS)?**

True Air Speed is the actual speed at which the glider is travelling through the air and this increases compared to IAS as altitude increases This is due to the reduction in temperature, pressure and density progressively reducing the pitot pressure that the ASI is sensing despite it going through the air at the same speed.

**What kind of stability does a glider have in the yawing plane?**

It has positive stability evidenced by it tending to return to its original heading when displaced (yawed) momentarily by application of rudder.

**How much does the stall speed increase by in a 60 degree banked turn?**

The increase is a function of the increased load factor, or “G” which for this AoB is 2G. The relationship or function is the square root so this would be 1.414...which gives an increase of around 40 %. For a basic stall speed of 38 kts, it increases to 54 kts.

**How can gusts stall the glider?**

Localised gusts from turbulent air, thermals and ridge lift can increase the angle of attack of part or all of the wing, exceeding the critical angle of attack and causing it to stall.

### **What are “Speed Limiting Airbrakes”?**

Speed limiting brakes will not allow a glider to exceed its maximum permitted speed ( $V_{NE}$ ). Most modern gliders are only certified as capable of achieving this in up to 45 degree dives. It is wise to consult the Flight Manual for detail for your glider type.

### **Why is loose tape on a control surface a danger?**

Loose tape will disturb the airflow behind it and make the control surface less effective. In extreme cases, it has caused control blanketing with associated handling problems. It can also work into a position where it can restrict or jam a control. It may also set up an unnerving vibration through the controls and high pitched whistling sound.

### **Why is a weak link fitted to a tow rope?**

The weak link is designed to protect the glider's and tugs structure from excessive loads during a launch.

### **What happens if the static vents are blocked?**

The instruments that derive a static pressure reading will be in error; the ASI, Altimeter and the Varios.

### **Why is it important not to pull gliders forwards or backwards by the wing tips?**

Pulling from the tips places too much strain on the wing root fittings because of the long leverage.

### **What are the errors of the ASI?**

The errors of the ASI are minimal and generally insignificant in normal flight. It does suffer position error which means any slip or skid can cause erroneous readings. There is a small degree of lag due to instrument error (friction within the mechanism) but the apparent lag in the reading is due mainly to the inertia of the glider and the fact that it takes time to accelerate when the attitude is changed. At altitude, the instrument fails to compensate for changes in temperature, pressure and air density so under reads the true air speed of the glider through the air.

### **Why does the glider have a maximum rough air speed?**

To protect the gliders structure from over stressing. At max rough air speed ( $V_a$ ) you can use up to full control deflection. Beyond this, a full control deflection will overstress the supporting structure. Up to  $V_A$  a strong gust will stall the glider before it over stresses it; beyond it, you risk structural overload and failure.

**What is the minimum recommended length for an aerotow tow rope?**

.Fifty five meters is the recommended minimum. This is a length that reduces the chance of tow upsets while maintaining ease of handling on tow. By starting with a longer rope, you can cut it and still be over the 55 m. in the event of a knot being impossible to undo.

**What causes gelcoat cracking on fiberglass gliders?**

The gelcoat is a protective layer of coloured polyester resin on the surface of the fiberglass cloth and epoxy resin. Polyester is more brittle and has a different coefficient of expansion to the material below so suffers different stresses to the main structure. The small cracks appear around stress points during routine flight loads but are accelerated by extremes of temperature and inflight loads and combinations of the two.

**19. Is it okay to land with the gear up to shorten the landing roll in a short paddock?**

No; the manufacturer intends the glider to be landed gear down and the safety of the cockpit structure and its role in protecting the pilot from injury during even normal landing loads is lost with the gear up. With the gear down and the wheel brake operational, there should be ample braking available

**28. Is it acceptable to do an aerotow launch using a towrope that has a knot in it?**

Normally NO as the rope is weakened by any knot.

**What do you do if you find the rope does not detach when you try to release from tow?**

Operate the release again; advise the tow plane by radio if fitted, otherwise fly out to the left of the tug and rock your wing, await acknowledgment then return to the normal tow position; expect to be released back near the airfield, over clear land in case the rope releases when released from the tug end; try releasing again to get rid of the rope once off tow; assume you still have the rope trailing unless positively advised of it having released and plan your final approach accordingly to clear obstructions.

**Who gives way when two gliders are approaching each other (a) head-on (b) on converging headings?**

.Head on, both gliders turn right; converging, the glider that has the other on its right gives way.

**What is the “clock code” and when is it used?**

Imagine an analog clock face superimposed on the glider where ahead is 12 o'clock, the right wing is at 3 o'clock, the tail is at 6 o'clock and the left wing is at 9 o'clock.. Use this to describe direction; a glider off your right wing is in your 3o'clock; a town in front of you is in your 12 o'clock...and add an estimated distance and a relative height ie. High, low or same level, to help describe the position relative to yours.

**Where should your left hand be during take-off?**

Resting on your left leg in easy reach of the release should it be needed?

**What action do you take if running out of height in the circuit?**

Adjust your aiming point and modify your circuit to land safely in the best available area.

**On which side does a glider overtake another glider?**

Overtake on the right

**Who establishes the direction of turn in a thermal?**

The first glider in the thermal unless local rules specify a direction as is often the case at a contest

**What is the recommended minimum length of rope to be used for ground towing a glider?**

Half the glider's span; to ensure it can not strike the tow vehicle if it swings out of control of the wing walker

**Why should you not rely on your altimeter to judge your height in the circuit?**

The altimeter measures height above a set datum; usually above sea level. It does not measure height above the ground and is prone to errors that make it too inaccurate for total reliance in circuit height planning.

**Why should you not fly when you have a head cold?**

Any cold is likely to be accompanied by some infection and inflammation of the eustachian tube and inner ear tissues which could be further irritated and damaged.

**Assuming that the glider is not taking off or landing, what is the minimum height to fly over a built-up area?**

1000ft

**What is the pilot's first priority immediately following a launch failure?**

Lower the nose to attain Safe Speed near the Ground.

**What details of your glider flights do you have to log?**

ALL

**What is the caution with self medication and flying?**

Generally a no- no as most medications are for use on the ground and are not suitable for pilots as they dull the body's sensors used for orientation. Check any medication with an aviation qualified doctor ensuring he realises you are wanting to fly as pilot in command and not just as a passenger.

**What should you do if the towplane gives you the Rudder Waggle signal?**

Check glider for anything that may be reducing performance eg dive brakes open

**What action does a pilot take before carrying out intentional stalling, spinning, or before aerobatics?**

Perform check and lookout

**Why and what are you checking under “Ballast” in the Pre Takeoff check?**

To ensure the cockpit loading is within the Minimum to Maximum allowable weight range so that the glider is operated within its certified Centre of Gravity (CofG) range. We check that if ballast weights are required, that the correct amount has been properly fitted and secured. If not required, we check that they are not fitted.

**What happens to the glider’s stall speed in a turn?**

It increases, because of the increase in effective weight due to an increase in the “G” loading

**What is the “Safe Speed Near The Ground” in a 10 kt wind in your glider?**

One and half Stall speed for your glider at your weight, plus half the wind velocity; so for a glider that stalls at 36kts, add 18 plus 5 and you get 58 kts as a safe speed in this example

**What is aileron drag and how do you and the glider’s designer compensate for it?**

A down-going aileron causes an increase in induced drag, resulting in yaw away from the direction of intended turn. This is called adverse yaw. The most common fix designers use is differential ailerons that have more upward travel than downward travel. The pilot is still left with the task of ensuring sufficient rudder is applied in coordination with the aileron application when rolling into a turn. Look at the types of aileron control on gliders at your site.

**Why is it important to clean the glider prior to flight?**

Cleaning removes any surface irregularities like dust, bugs, dirt etc that will create unwanted airflow disturbances that reduce lift and increase drag (and increase the gliders stall speed). All of this reduces the lift/drag ratio...your glide performance

**What happens to the glider’s stall speed with the brakes out?**

It increases by 2 to 5 knots, depending on the type of glider and amount of brake extended.

**What are the symptoms of the Basic Stall?**

Slightly higher nose attitude than the normal glide, with reducing airspeed as a result; reducing control effectiveness, because of the reduced airflow over them; change in the sound of the airflow, usually getting quieter as less flow around the

cockpit as speed reduces; light buffet as turbulent airflow separates from the wing and strikes the fuselage and tailplane surfaces.

**What is the primary function of the airbrakes?**

To control rate of descent, by increasing it when required; ie. on approach.

**How does airspeed affect control effectiveness and response?**

As speed increases, control effectiveness increases. ie. for the same amount applied the response is greater, so less input is required to get the same response as that of a slower speed. The controls also feel heavier when applied at higher speed.

**What force turns the glider?**

When the glider is banked, using aileron to roll it, the lift force is tilted in the direction of the turn.

**What affects the landing performance of a glider?**

Approach speed flown; amount of airbrake used; wind strength and direction; surface condition ie. grass short or long, wet or dry, ground hard or soft; tyre inflation; wheel braking.

**What is adverse yaw and how is it corrected?**

Yaw in the opposite direction to the intended direction of turn, caused by aileron drag. Counteracted by the coordinated application of rudder and aileron when rolling into a turn.

**What is “Induced Drag” and when is it greatest?**

Drag induced whenever the wing is generating lift. It is greatest when lift is greatest, ie. at high angles of attack, at low speed.

**What is the significance of the “Minimum Cockpit Load” for your glider?**

This is the minimum load required in the front seat to keep the glider operating within its certified C of G range. If the loading is too light, the C of G will be aft of the limit and elevator control effectiveness will be reduced to a point where if the glider was to stall, full forward elevator may be insufficient to reduce the angle of attack required for recovery.

**What is the method of checking the glider is trimmed for flight?**

1 Set an attitude for the speed you wish to be flying at, then gently relax your grip on the control column. If there is any tendency for the nose to pitch up or down, you are not correctly trimmed.

**What is the secondary effect of rudder?**

Roll caused by the outer wing travelling faster than the inner wing.

**What causes the pre stall buffet warning?**

Turbulent air flow striking the rear of the wing, the fuselage and tail surfaces and buffeting them

**If the glider's wing drops at the stall, what is the correct action on the part of the pilot?**

Stick forward and use only enough rudder to prevent yaw

**A glider flying at 60 kts into a 10 kt headwind will have a ground speed of what?**  
50 kts.

**What is the correct recovery action from a fully developed spin?**

Apply full rudder opposite to the direction of rotation, stick forward until the glider stops spinning, then centralise rudder and recover from the dive.

**What action is necessary to unstall a glider?**

Reduce the angle of attack below the stalling angle, achieved by moving the stick forward.

**What 3 forces act on the glider in flight?**

Lift, Drag and Weight

**Why does the nose of the glider pitch down at the stall?**

At the point of stall and beyond the critical angle of attack, the lift force acting through the centre of pressure reduces and moves aft. This change to the balance of forces acting on the wing has a net result of creating a nose down pitching moment.

**Why is there a Maximum Aero Tow and a Maximum Winch Launch speed?**

These speeds protect the glider from forces generated by higher speeds that may overstress the release attachment structure as well as the whole glider.

**Who has priority, a glider taking off or a power aircraft landing?**

The power aircraft landing. As has any aircraft landing

**Shortly after takeoff, the towplane rocks his wings...what do you do?**

.Release.

**What is "thermalling etiquette"?**

Rules of the air, courtesy and common sense advice on how to fly with others when thermalling. It includes things like keep a good look out, circle in the same direction, avoid flying in another glider's blind spot, try to have the same centre of turn, overtake safely, avoid abrupt changes in pitch and direction, don't be

aggressive.

**How long should you wait before flying after donating blood?**

24 hours

**Above what altitude must oxygen be carried and used?**

Oxygen must be available for use when operating above 10,000 ft above mean sea

**What documents must be carried in the glider?**

The DI book with the Airworthiness Certificate and the Flight Manual if all the placards necessary for safe operation are not visible to you in the cockpit.

**Who has right of way, a glider on finals or a glider about to launch?**

The glider on finals; landing aircraft have right of way over aircraft taking off. However, if the launch can be accomplished without hindering the approach of the glider then it is safe for it to proceed and in many instances may well free up more options for the landing glider. This is a matter of judgment for the wing runner.

**13. Who do you report a gliding accident to?**

ATSB, GFA must be notified via phone, fax or Internet. The Police need to be advised of any injury or property damage. The club CFI and President need to know for insurance purposes and any further action required by club rules.

**What is the “break-off point”?**

This is the point at which upper air exercises are terminated and full commitment is made to joining the circuit for the approach and landing.

**What cautions are necessary when thermalling downwind of the airfield?**

Be careful not to drift too far downwind and preclude your ability to do a full circuit to your intended landing place

**How much height do you think will be lost if you stall and do one turn of a spin in your glider?**

Most gliders will lose between 300 and 500 ft in a one turn spin.

**What height above ground must all intentional stalling be completed by?**

1000 ft.

**What are your actions if the canopy comes open during your launch?**

Keep flying the glider... it will fly with the canopy open... even if it is a bit breezy! If just airborne, release and land ahead. If later in the launch, continue to a safe height then release. Whatever you do, don't let go of the stick when on tow.



Once off tow, try and close the canopy. A bit of rudder to skid towards the canopy may help the airflow assist with closing it. If you can't close it, allow for the increased drag and subsequent increase in stall speed when planning your circuit and landing. Be mindful of possible damage to the tail area if the canopy comes off and strikes this area. Consider jettisoning the canopy if you think this will reduce any danger posed by having it open and flailing around. The best advice is to ensure it is closed and locked prior to take off!

**Who has responsibility for deciding whether to launch; the glider pilot or the towpilot?**

The tow pilot is responsible for the combination of glider and tug. If they say it is not suitable to launch, respect their judgment and stay on the ground.

**What cautions do you take if flying in rain?**

Rain drops disrupt laminar flow, reducing lift and increasing drag as well as increasing the gliders weight...albeit only fractionally. All this reduces the glider's performance and increases the stalling speed in all configurations. Water may also get into the pitot / static system so be alert for instrument failures. So, avoid getting wet where possible and if you get wet, fly a couple of knots faster to keep a safe margin above the stall and plan / allow for an increased rate of descent/reduced glide performance especially in the circuit.

**What height should paddocks be selected on a cross country and what height is the break off height?**

3 paddocks at 2000 ft agl and break off at 1000ft agl