

## What the Ops Team is Talking About

Memo to Club CFI's and other interested parties - March 2019 - *please forward to your instructors.*

A summary of the key items discussed at the Ops Team on-line meeting on 26 March 2019.  
David Moody (North), David Hirst (Central), Graham Erikson (South) and Martyn Cook (NOO).

### 1. Review of Incident Reports for Feb-Mar 2019:

- winch-trained pilot on aerotow, light single on belly hook, distracted for 3 sec, climbed above tug
- severe turbulence on tow due strong wind in lee, glider pushed high, glider + tug both released
- undercarriage lever actuated prior to downwind but wheel was retracted rather than lowered
- motor glider took off towards winch parachute on ground, wrong flap setting, longer ground roll
- heavy landing on airfield, 2 POB on training flight, student flying, some damage to undercarriage
- winch cable picks up k-line irrigator midfield after swinging sideways when tightened
- pitot tube blocked by insect deposits, 2 gliders in same club, ASI displayed serious damping
- neither battery secured, missed during DI, battery jumped out of holder during winch launch
- brakes open on launch, trainee had closed but not locked, P1 distracted issuing tug directions
- airbrakes found open at 2,200 feet after apparent slow tow, lower powered tug, contest launch

A lapse in focused attention and the hazard of distractions and interruptions is a thread through many of these reports. It is timely to issue a reminder to all Clubs about the hazards of an aerotow upset when the glider goes too high or too far out to the side. One pilot looked away at 1200 feet 'for about 3 seconds' to monitor separation from another aircraft and the tug almost disappeared out of sight below. Fortunately recovered. The second upset was due to strong turbulence on a day possibly too strong for gliders to be flying safely. Launching (winch or aerotow) does require full attention from the pilot, maintaining a full scan even when directing attention to a potential hazard.

Regarding the 'brakes open on launch' issue, the checklist sequence has been altered to BEC so that 'brakes' is no longer last on the list. It may take a new generation of pilots before this sequence is regularly used. A second factor is distractions during the preflight check, including activity around the cockpit or attempts to multi-task (eg. directions to tow pilot). It can be stressful on a contest grid. One Club reported that a "sterile field" around the cockpit is now insisted upon from the moment the pilots enter the cockpit. Only one person is permitted in the area forward of the wings, perhaps to help with straps, but that person should remain still and silent until asked to hook on.

It was considered changing the U-check to "Visually confirm that the undercarriage is down and locked", as opposed to "undercarriage down and locked". In some aircraft this may mean tidying up the placards so they are clearly visible. It was also recognised that performing pre-landing checks while executing a circuit is another form of multi-tasking in which one or both activities could be compromised. It was considered renaming the "pre-landing" check to "pre-circuit" to make this clear, as per UK practice: *During the circuit the pilot is better off flying the glider correctly, in the right place, and looking out (rather than working through a check-list), hence the use of a pre-circuit check, as opposed to a down-wind check.* In any case pilots could be encouraged to configure the aircraft for landing prior to joining the circuit. There might be an exception in the case of low winch launches for circuit practice, but this should not become normal.

A glider battery jumping out of its compartment during a winch launch was potentially serious. It appears that the trainee pilot performing the DI did not understand how to secure the batteries into the wing storage units, and no further check was made. The Ops Team briefly reviewed the rules around how the authority to conduct a DI (really a Class 1 Engineer Rating) is signed off, and the ever-present risk of complacency and over-confidence.

Pitot tubes can become blocked by mason wasps, which can build nests deep in small crevices and seal their egg chambers with a mud-like material. This blockage may not be visible from the outside. If the pitot tube still has even a slight air leak the ASI can still operate and seriously under-read or over-read at different phases in flight, as it did in this incident. Very confusing and potentially hazardous on a winch launch. Sealing open pitot tubes with sticky tape or a cover is recommended if these wasps are likely to be present. Some discussion around whether the "puff test" should be included in the DI schedule to check that the ASI is responding, or whether the risk of damage to pneumatic instruments is greater than the benefit.

## **2. Training Program Development - Moodle:**

The text of the British Gliding Association's Instructor Manual has been edited to reflect NZ conditions, the diagrams inserted, and has been loaded onto the moodle site for review. The text size has been increased to allow the documents to be read on small screens, and sections kept separate to comply with file size limitations. The next step is to review these sections in the light of NZ experience and incorporate what has been learned and adopted from the past. One example was the technique for correcting for lateral out-of-position on aerotow - it appears that some Clubs are not teaching the use of coordinated turns, but using the "rudder back with wings level" approach.

Consideration was given to adopting a process for reviewing all the moodle material prior to it being released for wider use. Four motions were tabled by G Erikson as a recommendation for a review process of the program. However, after considerable discussion and debate these were deferred to a later date so as to consider a "terms of reference" document in which the objectives and required standards of the program were set out. Each element of the program would then be assessed against this standard.

## **3. Instructor Conference at AGM**

The suggestion was made that Instructors be allocated a slot at the Gliding NZ AGM in early June to compare notes, raise issues and perhaps listen to a short address from CAA on incident reporting and evaluation. Other suggestions welcome.

## **4. The Fine Art of Instructing**

Brief discussion around the need for instructors to "protect" the flight controls when a trainee pilot is operating near the ground. In the past some trainee pilots have responded strangely to voice prompts: the example was given of an incident a few feet off the ground where the P1 said "push forward" and P2 vigorously obeyed, slamming the glider into the ground before the P1 had time to save the situation. A typical P1 posture might be with the left hand blocking the airbrakes from being opened, and the right hand loosely around or very close to the control column (but not touching it) and ready to grab it if required.

## "Don't Get Upset"

When the trainee is flying the complete launch, it is essential that he/she is well briefed on the ways in which incorrect glider handling can endanger the tow-pilot.

### a) **Glider Goes Too High Behind the Tug**

A serious problem arises when the glider gets too high in relation to the towplane. The tow-pilot, wishing to prevent being pitched nose-down, applies up-elevator. However, if the glider continues to climb behind the towplane, eventually one of two things will happen:

- The towplane will be pitched into a steep dive, or
- The towplane will stall due to full up-elevator with deceleration.

There are many fatal cases of both on record. Examining the first situation in more detail, the glider keeps on *kiting* upward behind the tug. The three most common causes of this are:

1. A hurried transition from low-tow to high-tow, resulting in the glider overshooting the high tow position and carrying on upwards.
2. The combination flying through strong lift then strong sink, with the glider correcting by climbing as the towplane experiences the lift and being forced higher when the glider hits the lift while the towplane encounters sink
3. The glider pilot pulls up as he releases but the rope doesn't release.

These situations are made much worse if the glider has a belly-hook or an all-moving tailplane or if the rope is too short. Too short is anything less than 50 meters. Speed increases rapidly as the glider gains height, for a constant towplane speed. This is the *arc of a circle* principle familiar to most winch-trained pilots. In the aerotow situation the basic towing speed is higher than on a winch launch, so any kiting effect, with its associated speed increase, is exaggerated. Not only does the speed increase when the kiting manoeuvre develops, but it is impossible to stop the glider going up. Full forward on the glider's control stick only reduces the rate at which the kiting develops - it does not stop it. It is impossible to fly the glider out of one of these situations once it has developed. The only solution is to prevent the glider getting into that situation in the first place.

The situation which develops is illustrated in the diagram below. The glider is a 'worst case' example having a belly hook and an all-moving tailplane. There are some gliders like this so any tendency for this to happen must be briefed as part of any conversion to such glider types.

**In all cases, the only safe action is for the glider pilot to release the rope the instant he loses sight of the towplane.**

## THE HIGH AERO TOW UPSET

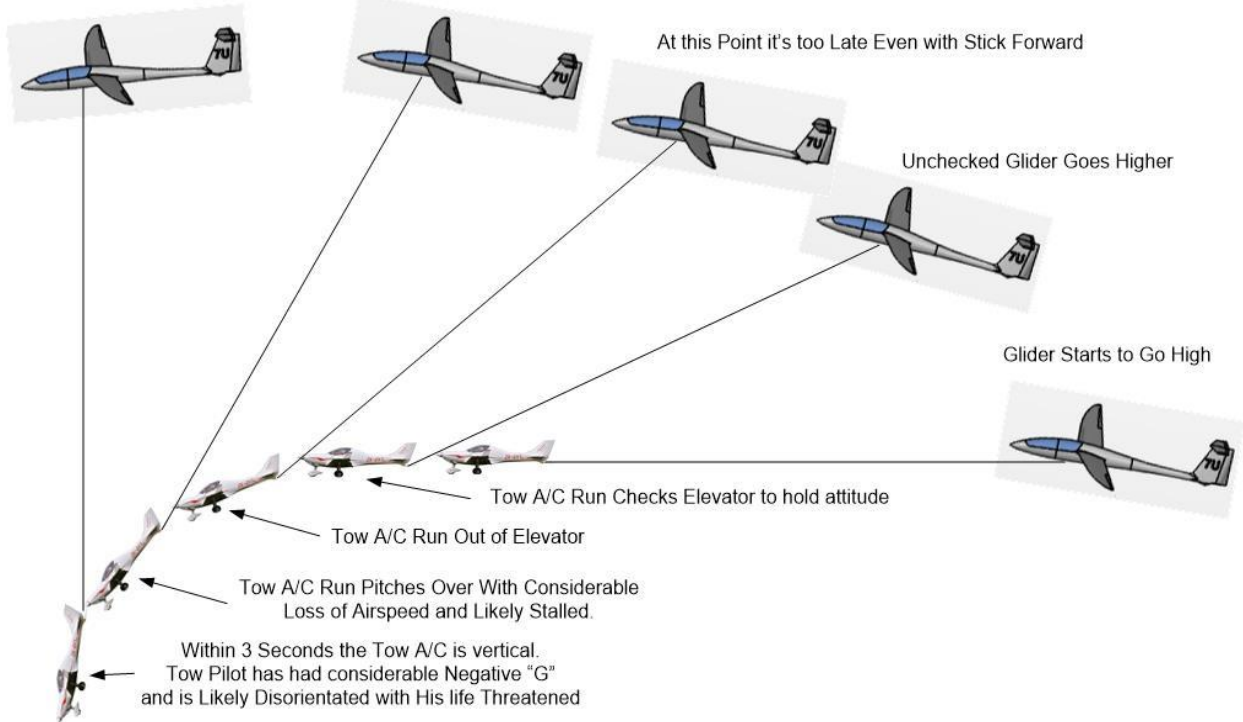
Release is Difficult Due High Tension Usually Weak Link Breaks

Glider Accelerates Like a Winch Launch

At this Point it's too Late Even with Stick Forward

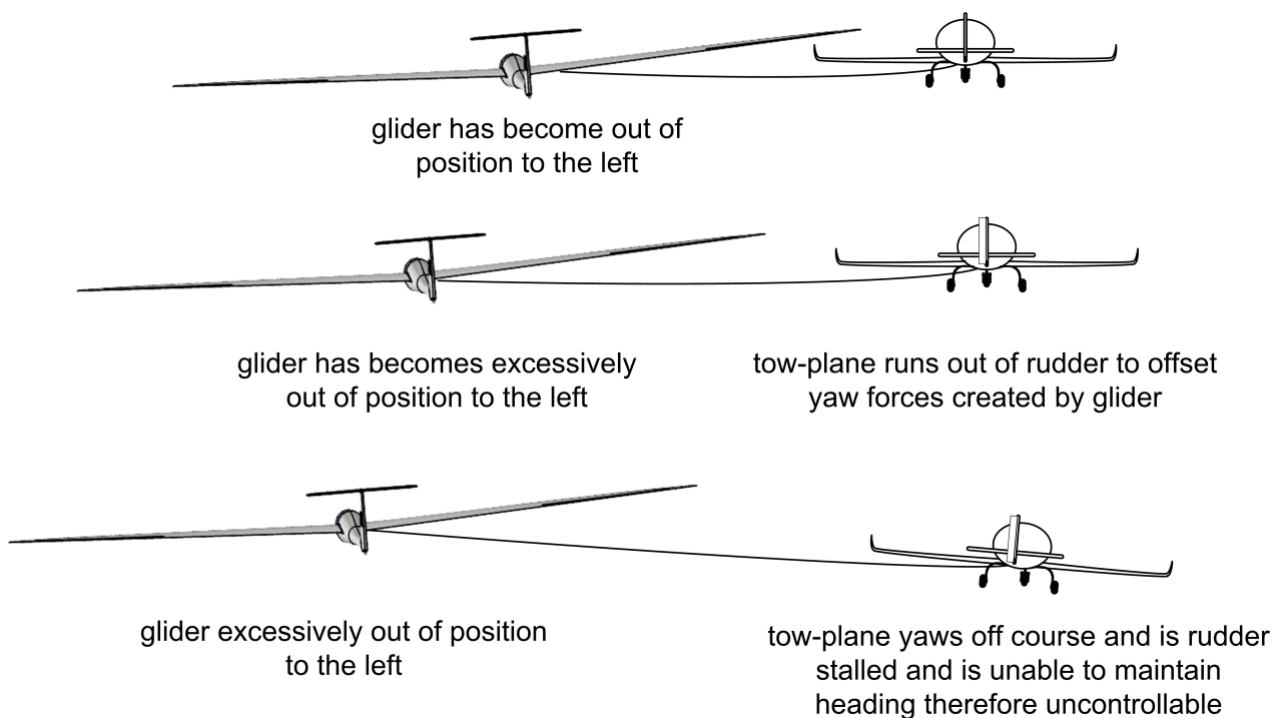
Unchecked Glider Goes Higher

Glider Starts to Go High



### b) Lateral Tow Upset

A Lateral Tow upset is caused by the glider traversing excessively out to either side of the tow aircraft. This can occur through a pilot's inattention to maintaining the lateral position (such as looking away for more than 1-2 seconds), turbulence, or being inattentive when the towplane turns.



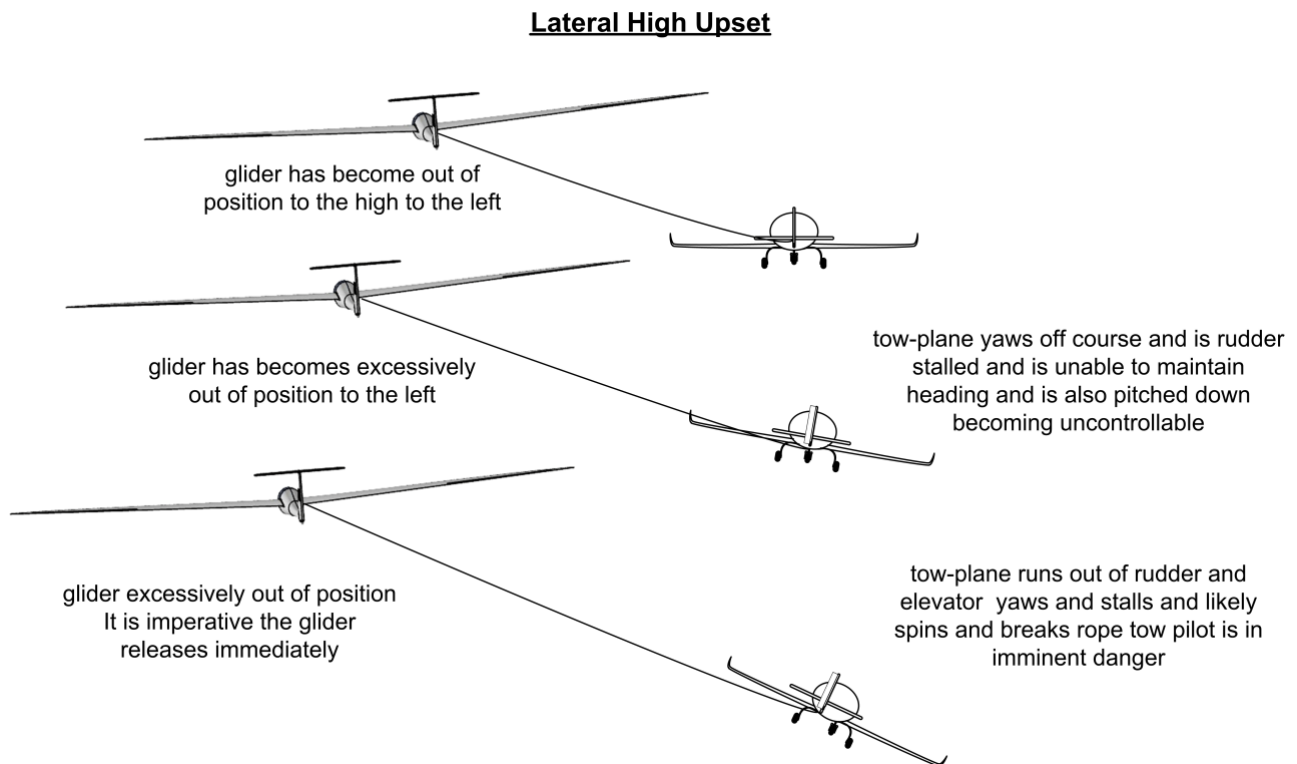
Remember that tow-pilot is trying to maintain a stable tow platform for the glider to follow. When the glider traverses out to the side the tow-pilot will offset the yaw forces with rudder. If the glider traverses beyond the limits of yaw that the tow aircraft can counter then the tow pilot is unable to maintain heading.

At this point the tow aircraft starts to depart uncontrollably from its intended heading with the fin and rudder possibly stalled. This can quickly become serious because the drag forces increase and slow the tow plane towards its stall speed. If a release is not effected immediately it is likely the towplane (with skid due to yaw and slow speed) will stall, causing it to enter a spin. The weak link should fail, allowing recovery, but if there is insufficient height for a full recovery, it can prove fatal for the tow pilot.

When boxing the wake it is not necessary for the centre of the glider to go sideways beyond the wingtip of the towplane.

### c) **High Lateral Tow Upset**

A Combination High Lateral Tow upset is caused by the glider traversing excessively out to either side of the tow aircraft and being too high. This can occur through a pilot's inattention to maintaining both the lateral and height position behind the towplane.



If the glider traverses beyond the limits of yaw and pitch such that the tow aircraft is unable to maintain heading then the glider must release. Likewise, the tow pilot should release whenever any control reaches the limit of travel.

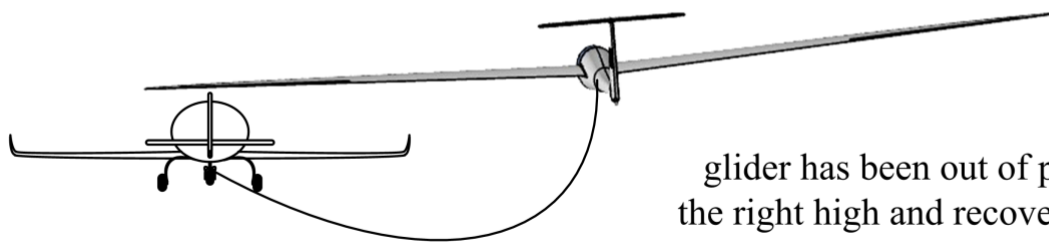
#### d) Dealing With a Slack Rope

On tow, there is very little load on the rope and it is possible for the tension to be reduced, allowing the rope to bow down and become slack. Demonstrate how this occurs on a typical tow if the glider is descended too hastily if recovering from above the desired tow position.

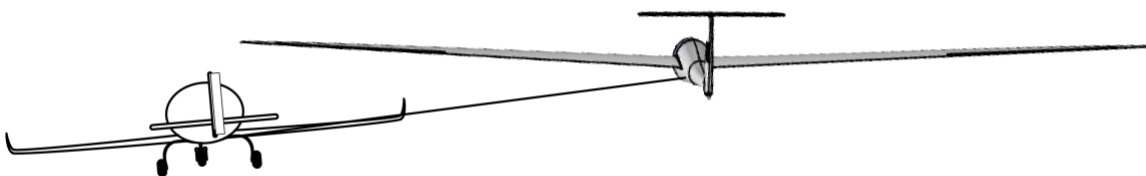
If excessive slack develops in the rope, the problem is best alleviated by yawing or careful use of airbrakes. Demonstrate and then have the student practice these techniques. Any action which results in the sudden tightening of the towrope is to be avoided as it has the potential to break the rope or upset the tow-plane. In all instances, the glider should be pointing along the line of the rope as it tightens to avoid any undesirable yaw in the glider as the rope comes tight.

With more powerful tow-planes, rope slack is seldom encountered during normal launch. It is important to trim the glider to fly with neutral pitch forces on tow as it considerably reduces the pilot's workload and helps avoid being out of position.

#### Slack Rope Hazard



glider has been out of position to the right high and recovered quickly causing rope to go slack



rope comes tight too quickly & tow aircraft yaws suddenly out of line by the forces created by glider. this can cause a lateral upset as show previously.

*Source Acknowledgement:* The text and illustrations were kindly supplied by Graham Erikson in 2018. Updated March 2019.