

Gliding Australia Training Manual

Pilot Guide



Unit 27 Advanced Aerotowing

Unit 27 - Advanced Aerotowing

WHAT THIS UNIT IS ABOUT

To develop and demonstrate the skills and knowledge required to conduct Advanced Aerotow techniques

WHAT ARE THE PRE-REQUISITES FOR THIS UNIT?

- GPC Unit 13 Launch and Release Aerotow
- GPC Unit 14 Takeoff Aerotow
- GPC Unit 19 Crosswind take-off and landing
- Unit 20 Launch emergencies

COMPLEMENTARY UNITS

- Nil

KEY MESSAGES

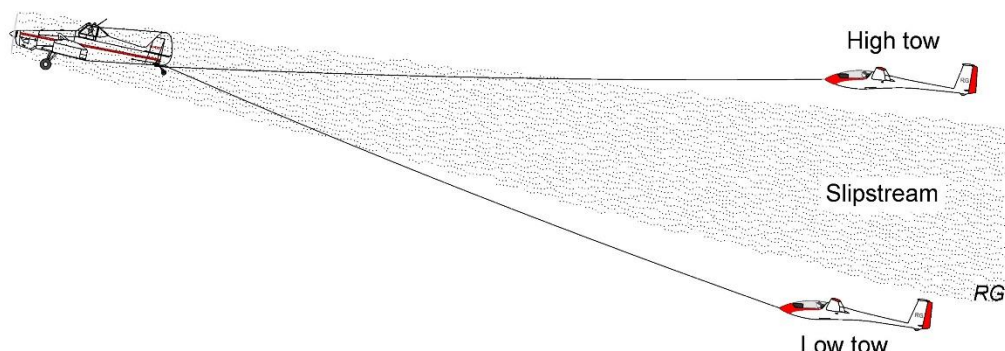
- Pilots are expected to fly safely in both high and low tow.
- Transitioning between these two positions requires care.
- Boxing the Slipstream is a very useful exercise in confidence building and co-ordination, enabling you to better recover from unexpected positions.

PILOT GUIDE FOR THIS UNIT

Transition between Low-Tow and High-Tow

- During this training you will be taught both high and low tow, and the correct way to transition between the two. In Australia we generally use low tow position but there are times when High tow is a better option:
- Long distance ferry flights are best done in high tow due to decreased drag on the towplane.
- When flying over obstacles high-tow provides a slightly better clearance.
- If your glider is using a belly release rather than a nose release there may be some advantage in using high tow.
- Transition from low-tow to high-tow requires care in particular as you fly through the slipstream.
- It is important that you make constant progress by maintaining some back pressure on the stick. It is easy to remove the back pressure and the glider gets stuck in the turbulent air. Maintain the pressure so that the glider moves upwards and out of the slipstream.
- Similarly, you don't want to transition too quickly as you may lose sight of the towplane if you go too high which can create a danger for the towpilot.
- Once clear of the slipstream you are in the correct high tow position

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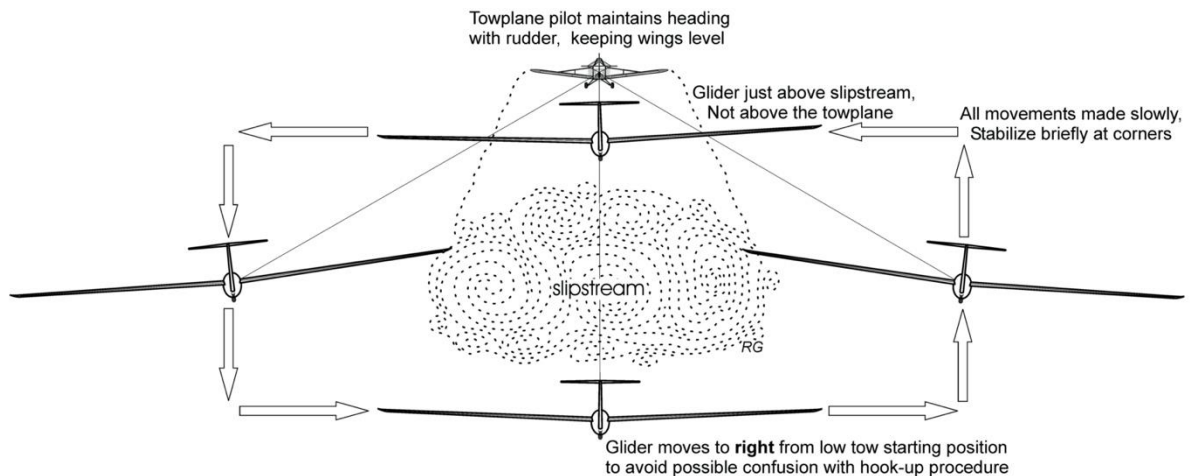


- Transition from high-tow to low-tow is slightly easier in that you maintain vision of the towplane.
- It is important that you make constant progress by maintaining some forward pressure on the stick.
- Once clear of the slipstream you are in the correct low tow position.

Boxing the Slipstream

- The aim is to fly the glider around the slipstream so you should avoid the turbulent air.
- We fly to the **right first** so as not to confuse with hook up procedure. See Unit 20 Launch Emergencies.
- Smooth movement of the controls is required, and there is no need to rush.
- Use rudder and aileron to bank the glider and move to each side so that the glider's nose is slightly outside of the towplane's wingtip. Hold just enough bank to stabilise in each corner of the box as forces from the tow rope will attempt to pull the glider back to centre. (Note slight bank in the diagram). After stabilising, move on the next 'leg'.
- When traversing from the top right to top left corner, initially reduce the amount of right bank to drift into the centre and don't reverse to left bank until almost behind the towplane. Maintain the towplane's wheels on the horizon from the top right to top left corners.
- If the glider moves too quickly into the centre, a bow may develop in the rope. As soon as a bow starts to form, increase the pressure on the towrope by increasing the bank slightly away from the towplane and slow the rate of movement into the centre. If the bow in the rope tightens too quickly, be ready to release the towrope just before the rope pulls tight to avoid a tug upset or broken weak link.

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Cruising on Tow – High-Tow and Low-Tow

- On long retrieves or positioning tows, low tow is easier to maintain, especially in turbulent conditions.
- In smooth conditions, high tow has the advantage of the glider pilot being able to see more of the ground ahead for situation awareness. Also if the glider has a belly release, it lessens the rope rubbing on the nose.
- In level flight, with the tug/glider combination not climbing, e.g. cross-country ferry flights, the feel of the glider is quite different, as follows -
 - The trim of the glider is considerably affected - the trim control will almost certainly need to be reset.
 - Slack will develop in the rope very easily. Airbrakes may be cracked and used to help keep the rope tight, or the glider can be flown in the tug slipstream - this creates quite a lot of extra drag.
- When releasing from tow in level flight, there must be no delay in making the right turn, otherwise the rope may get quite close to the glider. This is true whether releasing from the high tow or the low tow position.
- The slipstream may be in a slightly different position compared to where it usually is. However, as usual, low-tow is still just below the slipstream and high-tow just above.

Descending on tow

- This may be required when descending below airspace steps or lowering cloud base.
- Descending on tow is more likely to result in a slack rope, in particular if the tow pilot reduces power too quickly. Use of airbrake is likely to be required to maintain tension on the rope. Yawing the glider can also add some drag to maintain rope tension.
- Radio communication with the tow pilot is typically required.

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Lookout

- Emphasise to look ahead at the towplane but also search for possible conflicting traffic. The glider pilot will typically have better visibility than from the towplane. Scan ahead, above and to each side on a regular cycle.
- If you see possible conflict you should use the radio to advise the tow-pilot.

FLIGHT EXERCISES FOR THIS UNIT

- You will be introduced to flying in high tow and then transitioning from low tow to high tow and then back to low tow.
- Once you have mastered this, you will then be shown boxing the wake and given the opportunity to try this. You will generally pick up this skill in a couple of flights, but it can be more difficult with a powerful tug.
- You will be introduced to cruising straight and level and then descending on tow.
- You will be shown how to avoid getting a bow in the rope, and what to do when this occurs.

THINGS YOU MIGHT HAVE DIFFICULTY WITH

COMMON PROBLEMS

- The pace to move through the slipstream without “getting stuck”
- Levelling out above the slipstream.
- Identifying normal relative position of the towplane when in High Tow.
- Poor control when in high tow and with boxing the slipstream can result in a tug upset. When you lose sight of the towplane below the nose of the glider you must release.
- Getting out of station is quite possible in each of these maneuvers so a good level of aircraft control is required prior to starting these exercises.
- Descent on tow may result in the glider catching up to the towplane due to its lower drag. Use slip or airbrakes. Be prepared to release if necessary.
- Rapid use of airbrakes can break the tow rope. “Crack” the brakes slowly.

HOW DO YOU DEMONSTRATE COMPETENCE?

- Transition from low tow to high tow then back to low tow.
- Demonstrates correct pace to avoid getting caught in the slipstream and to avoid kiting manoeuvres.
- Demonstrates correct pace to complete boxing the slipstream manoeuvre.
- Airspeed is maintained throughout.
- Maintain level flight on tow in both high and low tow position.
- Demonstrates descent on tow, with use of airbrake where required.
- Airspeed is monitored and adjusted and Bows in the tow rope are corrected.

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- Appropriate lookout is demonstrated.

RESOURCES & REFERENCES

- Nil

SELF-CHECK QUESTIONS

Use these questions to test your knowledge of the unit.

- Describe the correct High-tow position
- List two hazards when moving from low-tow to high-tow
- Describe the process to Box the Slipstream
- Why are you more likely to get a bow in the rope when cruising or descending on tow compared to a normal launch?