

Gliding Australia Training Manual

Trainer Guide



Unit 31 Thermal Entry

Unit 31 - Thermal Entry

AIM

To develop the student's knowledge and skills for safe thermal entry and the first Thermaling turn.

PRE-REQUISITE UNITS

- GPC Unit 30 Thermal Centring Techniques

COMPLEMENTARY UNITS

This unit should be read in conjunction with:

- GPC Unit 32 Soaring with Other Gliders

COMPETENCY ELEMENTS AND PERFORMANCE STANDARDS

ELEMENT	PERFORMANCE STANDARDS
1. Identify a thermal	<ul style="list-style-type: none"> • Identify <ul style="list-style-type: none"> o A thermal (as opposed to a gust)
2. Enter a thermal	<ul style="list-style-type: none"> • Demonstrate <ul style="list-style-type: none"> o Appropriate lookout o Appropriate nose attitude o Waiting for the peak before turning o Identifying if the turn is away from the core and correcting

KEY MESSAGES

- Initial turn direction is less important than making the turn – it can be corrected if wrong
- Minimise changes in attitude during entry to maximise feel
- Lookout with respect to thermal entry and ongoing scan
- The vario indication is not particularly useful for thermal entry due to lag and gust sensitivity. In particular the vario indicates rising air with a lag and horizontal gusts instantaneously, so it's very important to learn to enter thermals by feel
- Steps for thermal entry
- Patience

Unit 31 - Thermal Entry

LESSON PLANNING AND CONDUCT

Briefing

Conduct a ground briefing covering the following elements:

- Refresh vario lag discussed under GPC 30 – Thermal Centring Techniques. Brief the impact of horizontal gusts on the vario indication as discussed in the pilot guide for this unit – this can make the vario indication useless for thermal entry. Discuss the importance of feel of vertical accelerations. The vario is used to confirm what was felt.
- The three key decisions on thermal entry: Deciding to turn/not turn; when to turn; and which way to turn.
- With reference to the diagram in the pilot guide for this unit, discuss the feel and actions on thermal entry. In particular draw attention to:
 - o Full scan and targeted scan. When approaching a thermal, there is a good chance others are as well and from any direction. A FULL and TARGETED lookout scan is essential to ensure situational awareness and to predict where each glider is likely to be when the thermal is joined well before actually entering the thermal.
 - o Turning the same way as gliders already in the thermal. If joining a thermal with other gliders, the turn must be in the same direction as the other gliders, and if at the same height the glider should be positioned opposite. The direction of turn of other thermalling gliders can take a while to establish when approaching. Once the direction of turn is clear, aim to arrive outside of the turn being used by other glider(s). They need to be concentrating on climbing and not avoiding you! See also GPC 32 – Soaring with Other Gliders.
 - o The ‘cobblestone’ feel approaching the thermal as a trigger to set nose attitude for reduced speed. Entry speed for feel and manoeuvrability should be 10-20 knots below cruise speed.
 - o The need to WAIT when flying through the surge (or increasing vario indication)
 - o Turn if/when the acceleration has been sustained for at least five seconds or when the upward acceleration stops (refer to decision chart in the pilot guide)
 - o Assess based on feel if the turn was the right way
 - o If the turn is towards sink continue the turn through 270°, then straighten for between 3 and 10 seconds (see further information in the pilot guide), and resume turn
 - o Re-trim to thermalling speed
 - o On the next turn re-centre the turn as necessary

Flight Exercises

Demonstration of thermal entry and first turn

From well outside a thermal refresh what will be felt and the actions on thermal entry:

- Draw attention to FULL SCAN and TARGETED SCAN
- Discuss appropriate entry speed and when to adjust the nose attitude
- Discuss the need for waiting for the sustained surge or vario indication before turning
- Then as you fly into the thermal:
 - o Verbalise feel in the context of the thermal structure – turbulence, the surge and

Unit 31 - Thermal Entry

relate this to the vario indication when it happens. Ask the student to tell you when they feel the surge.

- o Verbalise the decision if/when to turn
- Demonstrate the first turn
 - o If turning in the correct direction, verbalise the choice of angle of bank – tight turn (40°) if acceleration feel is building on turn entry; shallower turn if searching
 - o If turning in the incorrect direction, demonstrate the process of turning through 270°, straightening for 3 to 10 seconds, then recommencing a tight turn.
- Repeat as necessary.

Student Exercises

The student practices thermal entry as many times as possible on a cross country flight. (If conditions are not suitable for cross country, the trainer can fly out of a thermal for about 20-30 seconds and then turn back. Hand over to the student when approaching the thermal again)

Note

- Don't introduce thermal entry when there are other gliders in the thermal at similar height (within 500 feet). Once the student has a good grasp of the concepts this can be relaxed.
- The student must be relaxed to be able to feel the thermal. Trying to combine other exercises may overload them and be counterproductive.
- Make sure appropriate lookout scan is continuing at all times. Be aware of the student fixating on the panel and attitude only. NEVER allow the student to turn without a clear lookout first.
- If the student is reacting to the vario and not feel, ask the student to turn the sound off (check they know how to do this before the flight) and cover the vario display(s) (this will likely have to be done on the ground).
- Make sure attitude is held constant from well before the area of rising air is entered. Changing attitude applies vertical accelerations to the glider, masking the thermal feel.

COMMON PROBLEMS

Problem	Probable Cause
<ul style="list-style-type: none"> • Turning in a gust 	Not waiting for a sustained surge of at least 5 seconds
<ul style="list-style-type: none"> • Turning too late 	The student taking too long deciding which way to turn – get the student to pick a direction before reaching the thermal
<ul style="list-style-type: none"> • Turning too early 	Not waiting for at least 5 seconds or until the surge subsides before turning

Unit 31 - Thermal Entry

Debrief

Review

- Lookout when approaching a thermal and on entry
- Understanding of thermal structure and size
- Understanding of lag and gust limitations of variometers
- Awareness of accelerations and gusts and how they feel
- Steps for thermal entry
- Patience

THREAT AND ERROR MANAGEMENT

- The primary threat for thermal entry is collision with other gliders either already in the thermal or approaching at the same time. Thermal entry can be high workload so be wary of poor lookout while distracted by other tasks.
- When approaching a thermal, there is a good chance that others are as well and from any direction. A FULL and TARGETED lookout scan is essential to ensure situational awareness and to predict where each glider is likely to be when the thermal is joined well before actually entering the thermal. If another glider is in the thermal it can be difficult to see which way it is turning from some distance away so be vigilant as the thermal is approached.
- Always thermal in the same direction as other gliders, regardless of height differences (look for gliders that may be much lower or higher).
- Always assume that there may be gliders approaching the thermal or in the thermal in addition to any that you have seen.
- Before commencing the first turn a TARGETED SCAN is required in the direction of the turn.
- Encourage your student to only glance at the vario when necessary – in any case the vario is not a very useful instrument for thermal entry.
- Do not enter the thermal if there is any collision possibility with other gliders. Do not assume that other pilots have seen you.