

Gliding Australia Training Manual

Trainer Guide



Unit 40

Cruising, speed to fly, height bands and thermal selection

Unit 40 – Cruising, speed to fly, height bands and thermal selection

AIM

To develop the student's skills and ingrained habits in selecting a path through the air that improves achieved glide performance; selecting and maintaining an appropriate speed to fly; using height bands to manage risk in terms of locating the next thermal; and choosing which thermals to accept.

PRE-REQUISITE UNITS

- GPC Unit 39 Advanced soaring instruments and flight computers

COMPETENCY ELEMENTS AND PERFORMANCE STANDARDS

ELEMENT	PERFORMANCE STANDARDS
1. Demonstrate Cruising - Track selection	<ul style="list-style-type: none"> • Demonstrate <ul style="list-style-type: none"> o Looking to the distance on track to identify several thermal sources and/or cumulus clouds and following a pathway through these to maximise the chance of finding thermals o Identifying and following a pathway through areas of rising air to extend glide performance whilst making progress on task
2. Identify Height Bands	<ul style="list-style-type: none"> • Identify <ul style="list-style-type: none"> o Appropriate height bands for the conditions
3. Demonstrate appropriate cruise speeds	<ul style="list-style-type: none"> • Demonstrate <ul style="list-style-type: none"> o Consistently determining and adjusting cruise speed based on height band and expected conditions o Maintaining the nominated speed throughout the flight +/- 5 knots
4. Select thermals appropriately	<ul style="list-style-type: none"> • Identify <ul style="list-style-type: none"> o The thermal strength required appropriate to the height band and conditions • Demonstrate <ul style="list-style-type: none"> o Selecting only thermals that meet criteria
5. Demonstrate final glide	<ul style="list-style-type: none"> • Identify <ul style="list-style-type: none"> o Sufficient height for final glide • Demonstrate <ul style="list-style-type: none"> o Monitoring glide and taking appropriate actions

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KEY MESSAGES

- Aim to fly a track through rising (or less sinking) air to improve glide performance and maximise the chance of finding the best climbs.
- The speed to fly should be based on the expected conditions ahead, not the last thermal.
- Cruising strictly to MacCready speed to fly theory is inefficient and impossible to achieve - use block speeds (plus or minus 10 knots) that approximate MacCready speeds.
- Don't take every thermal unless necessary - be selective with thermal strength and avoid wasting time by centring too many thermals.
- Don't climb to the top of each thermal - leave when you think the next climb will be better (or to remain below cloud).
- Divide the convection height into three bands: in the top band cruise fastest and only take strong climbs; in the middle band cruise more conservatively and be prepared to take weaker climbs; below 2000 feet prepare for an outlanding and stay within reach of an appropriate landing site while searching for a climb.
- Transition from a soaring pilot to a landing pilot with sufficient height for a safe circuit.

LESSON PLANNING AND CONDUCT

Briefing

Using the pilot guide as a reference brief:

- Cruising – Track selection
- Height Bands
- Speed to Fly
- Thermal selection
- Final glides

Do not brief in too much detail. These topics are an introduction at the GPC level and will be discussed in more detail in the advanced training syllabus. Final glides are for more advanced cross-country.

Assist the student to plan a task. The task for this unit will need to be of sufficient length to demonstrate and allow the student to practice each of the competencies. A triangle task of at least 150 km should be sufficient.

Review the set task:

- Based on the weather forecast, determine thermal height and strength expected.
- Nominate height bands and expected cruise speeds.
- Consider potential thermal sources on track, and areas with potentially weaker thermals.
- Identify where the last thermal for final glide is likely to be.

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Flight Exercises

Demonstration

- Point out the direction to the next waypoint whilst you fly the glider. Point out areas of better or reduced thermal potential, areas that may be hotter or have good trigger points. Point out lines of cumulus (if present) in the general direction of track and describe hopping between the clouds.
- Advise the upper height band and challenge the student not to thermal until coming to the bottom of the height band. Suggest the appropriate speed to fly and state the need to maintain this speed unless flying into lift, when you can reduce speed by 10 knots to get a better feel.

Student Exercises

- Key skills are flying in the direction of track, aiming for a good thermal or thermal source, and maintaining the set cruise speed. Monitor these three elements and provide positive feedback, or suggest improvements.
- Monitor and emphasise lookout and use of trim.
- Once this has been consistently demonstrated change the focus to feeling for better air as you fly towards the next thermal. Fly at a slower speed to get better feel if necessary.
- Point out the height lost in reaching the next thermal and monitor this for subsequent glides. As the glider descends to the next height band, make sure you announce this and encourage a small speed reduction and greater focus on finding a thermal.
- As you approach 2000 feet talk about a possible outlanding and then take over. Your focus should be to climb. Ask the student to identify suitable landing fields. Monitor their contribution, but also consider alternatives.
- There is no problem with outlanding. It will be a good experience for the student. Do not try thermalling at very low altitude in order to 'save' the flight. This sets a poor example for future solo flights.

COMMON PROBLEMS

Problem	Probable Cause
<ul style="list-style-type: none"> • Losing too much height in the glide 	Not selecting and following an appropriate track
<ul style="list-style-type: none"> • Cruising speed too slow or too fast for the conditions 	Incorrect understanding of appropriate cruise speed Not considering the height band and looking at the conditions ahead Inattention to cruising speed
<ul style="list-style-type: none"> • Limited ability to feel the air 	Cruising too fast
<ul style="list-style-type: none"> • Taking every thermal regardless of strength 	Not selecting thermals in accordance with the selection criteria (is the next thermal likely to be better?)
<ul style="list-style-type: none"> • Climbing in weak rising air at the top of a thermal 	Not leaving when the next thermal is likely to be better

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THREAT AND ERROR MANAGEMENT

- The primary threats for this unit relate to outlanding and collision with other traffic.
- Recap with the student threats and mitigating actions identified in the GPC units 'Soaring with other gliders', 'Outlanding planning, demonstration and execution' and 'Navigation and airspace'.
- Reinforce the importance of transitioning at the appropriate time from a soaring pilot to a landing pilot, allowing sufficient height for a full circuit, and not selecting a track over unlandable terrain. In particular discuss the dangers associated with becoming low on final glide and the temptation to try stretch the glide to the airfield – make an early decision to find a thermal and plan for a possible outlanding.
- As always, emphasise the importance of maintaining good lookout at all times.

TRAINING MATERIALS AND REFERENCES

- G Dale. 'The Soaring Engine – volume 1', Chapter: Flatland soaring
- G Dale. 'The Soaring Engine – volume 3', Chapter: Flying