

# **Gliding Australia Training Manual**

## **Pilot Guide**



### **Unit 15**

### **Break Off & Circuit Planning**

## Unit 15 - Break Off & Circuit Planning

### WHAT THIS UNIT IS ABOUT

To

- Decide when a flight is to be terminated - to transition from soaring pilot to landing pilot.
- Identify a circuit pattern appropriate to the airfield, weather, traffic and other factors.
- Determine location of the circuit joining area, based on the selected circuit pattern.
- Configure the aircraft for circuit and determine when to use the pre-landing check.
- Demonstrate good lookout and traffic separation in the terminal (circuit) area.

### WHAT ARE THE PRE-REQUISITES FOR THIS UNIT?

- GPC Unit 7 Straight Flight Various Speeds, Trim.
- GPC Unit 9 Lookout Scan Procedures
- GPC Unit 10 Use of Ancillary Controls

### COMPLEMENTARY UNITS

This unit should be read in conjunction with:

- GPC Unit 16 Circuit Joining and Execution.
- GPC Unit 19 Crosswind take-off and landing.
- GPC Unit 20 Launch Emergencies.
- GPC Unit 21 Radio Use and Endorsement.

### KEY MESSAGES

- Landing is a high-workload phase of flight – ensure distractions are minimised and aircraft configured correctly at height.
- Identify options for joining a circuit with other traffic (refer CASA CAAP 166-01).
- Break off from soaring flight with enough height to return safely to the chosen landing area.
- Landing areas are generally high traffic areas – Situational awareness of traffic is critical.
- Maintain separation from obstacles and restricted airspace.
- Be prepared to modify the circuit plan if circumstances – traffic, weather, etc. – require.
- Be prepared to land off-field within the selected circuit area if necessary because of meteorological reasons, runway blockage or pilot error of judgement.

### PILOT GUIDE FOR THIS UNIT

Sooner or later we must make a decision to land the glider, either because we have had an enjoyable flight and it's time to bring the glider back for someone else to use, or because we have run out of lift and can't stay up any longer.

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You must transition from a soaring pilot to a landing pilot – this is a key decision and lets you focus on the critical decisions for a safe landing.

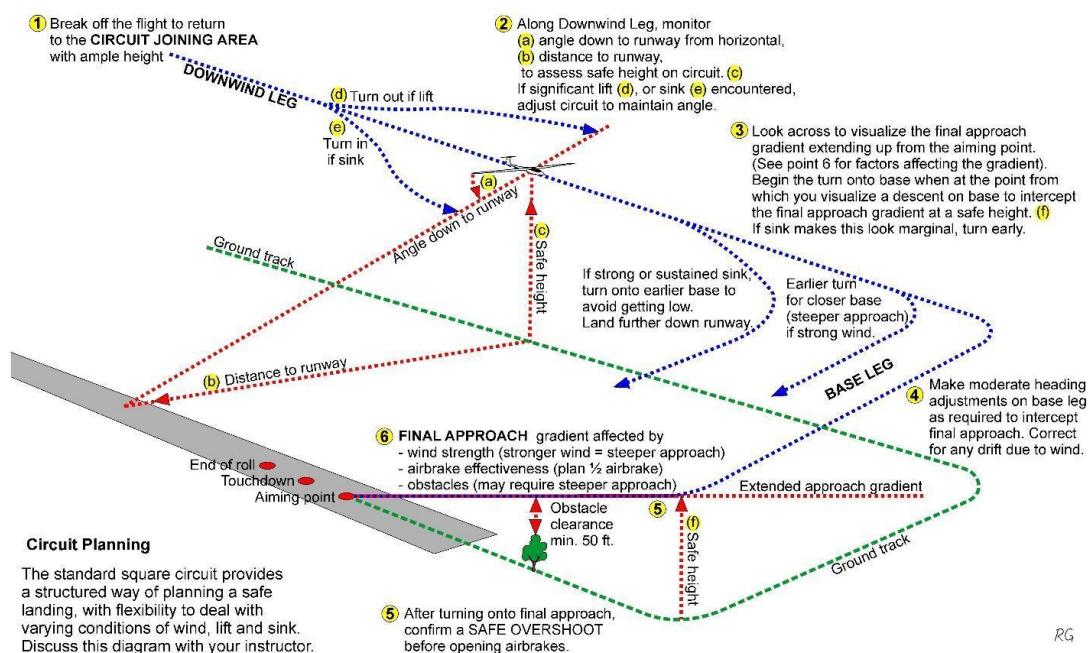
We must therefore consider the factors necessary for a safe landing. For a safe landing we must have:

- A suitable landing area
- A preselected landing direction and
- A final approach path with a safe margin over obstacles.

### Break Off

- The variables used for determining when to cease soaring flight and return to the circuit include ensuring there is always **sufficient height** to transit to the circuit and to monitor any changing weather conditions.
- Failure to make this decision with sufficient time and height to plan and conduct a circuit to land will lead to serious difficulties, rushed planning and possible accidents.
- Ensure you can return to the landing area with sufficient height to join circuit on arrival.

### Identify Landing area, circuit pattern and circuit joining area



- You'll want to get into the habit of assessing wind, sun, traffic and other factors early so you can decide on your landing area and circuit pattern early and give yourself plenty of time to plan the circuit.
- Identify a clear landing area on the airfield or suitable alternate if insufficient height to reach the airfield.
- Identify an appropriate circuit direction and circuit joining area in accordance with airfield procedures, weather conditions and aircraft performance. We always land into wind unless the circumstances require another option to be taken.
- Consider options for joining a circuit with other traffic.

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- Consider options to join on Base, Final, from a 45° angle onto Downwind and Crosswind.
- Ensure that you maintain separation from traffic, other obstacles and remain outside restricted airspace.
- Continual evaluation of alternates – if other traffic appears, if wind changes, if lift/sink occurs etc.
- Consider options for emergency off-field landings within the selected circuit area due to meteorological or human factor reasons taking into account:
  - Wind direction considerations.
  - Minimum field length requirement.
  - Ground looping rather than going through a fence.
- Normally, your landing direction will be into wind, but there are factors which can affect your decision.
  - If the sun is low, you may want to avoid a base leg or finals looking directly into the sun.
  - If the strip has a slope, given the choice of landing downhill and into the wind or making a downwind landing uphill, the uphill option may be the better choice.
- As you approach, you should be prepared to modify your plans based on the current situation on the ground and in the air around the strip.

### Transit to Circuit Joining Area

- On approaching the circuit joining area, your first task is to increase your lookout for other aircraft in or near the circuit. Maintain situational awareness of traffic & environment.
- Conduct TARGETED SCAN of circuit area and periodic FULL SCAN to maintain situational awareness.
- Check the volume on your radio as you should be able to hear any radio traffic.
- Transit must not conflict with circuit direction – avoid potential head-on situation.
- Consider tracks over the runway or on the dead side of circuit if appropriate for site. [Not with winch launching in progress].
- Look for obstacles or wildlife on your chosen landing area. The most likely obstacles you are going to face at most gliding clubs are tugs and gliders on the ground or in circuit or other traffic in the area.
- Gliders don't always follow the same circuit pattern, Look out for:
  - gliders who landed earlier and have not cleared from the strip.
  - gliders already on approach to the strip. Beware of aircraft who have decided to land in the opposite direction or on a cross strip.
  - gliders that are still launching. Identify glider and towplane traffic.
  - a circuit may be carried out in any direction if it is necessary. You may see a wide variation in landing approaches any day at a club, including straight in approaches, none of which is breaking any law.
- It is essential that extra care is taken if you are going against the normal direction to minimise disruption to other airfield users. However, it is better to fly a circuit in the wrong direction than risk getting too low trying to get to the conventional side of the circuit.

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- If there is a cross wind component and you can choose the circuit direction, the most sensible direction all other things being equal, is one where the base leg is into wind. A down-wind heading on a base leg will make your base leg shorter and can make the turn onto final more hurried than it should be, reducing the time for making decisions.

### Radio procedures

It is normal to do a call as you join a circuit and if things are busy in the area; it's a good idea to make another call when you turn onto base or final if the circuit is busy. Your instructor may do this for you until you are more comfortable with circuit planning.

### Circuit Preparation

- Manoeuvre aircraft towards the circuit joining area. Judgement is required to arrive at the circuit joining area at a suitable height.
- Do not return to soaring flight.
- Adopt safe speed attitude below 1000' AGL ( $1.5V_s$ ). Determine the Approach Speed ( $1.5V_s + \frac{1}{2}$  Wind speed).<sup>1</sup>
- You should already have a good idea what the wind strength and direction is and know what your preferred landing direction is but check the windsock to see if the wind has changed while you were airborne.
- Configure Aircraft for landing:
  - Straps are tight.
  - Water ballast dumped in gliders so equipped.
  - Engine configuration set.
  - Radio is on the correct frequency, volume and squelch are correctly set, and the microphone is positioned for best performance.
  - Flaps set.
  - Undercarriage lowered. Check the lever against placard for DOWN.
  - Speed required at circuit
  - Trim to an appropriate speed for the downwind leg.
- Reassess landing area feasibility and consider emergency options within the circuit area. Your aim is to arrive at the circuit joining area prepared for landing. Identify a suitable alternate landing area if your original plan is not working.
- Conduct TARGETED SCAN of circuit area and periodic FULL SCAN to maintain situational awareness.

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<sup>1</sup> Determine Approach speed ( $1.5V_s + \frac{1}{2}$  wind speed) at the break-off point.

**Set approach speed** from the break-off point, but at the latest, before the pre-landing checks, (which is early on the downwind leg).

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### THINGS YOU MIGHT HAVE DIFFICULTY WITH

COMMON PROBLEMS	
Problem	Probable Cause
<ul style="list-style-type: none"> <li>Transits through active circuit area, over runway (if winch club) or other inappropriate path to joining area.</li> </ul>	<ul style="list-style-type: none"> <li>Fixation on joining circuit may result in failure to maintain adequate situational awareness of where aircraft is in relation to airfield.</li> <li>Incorrect decision as to where to locate the circuit joining area – where possible it should be located such that flying over the strip is not required.</li> </ul>
<ul style="list-style-type: none"> <li>Inadequate height for aircraft to return to chosen landing area</li> </ul>	<ul style="list-style-type: none"> <li>Late decision to break off from Soaring Pilot to Landing Pilot</li> </ul>
<ul style="list-style-type: none"> <li>Student selects same joining area regardless of height or location.</li> </ul>	<ul style="list-style-type: none"> <li>You may be flying by rote – using the same pattern as done previously in the belief it will still work.</li> </ul>
<ul style="list-style-type: none"> <li>Fixation on particular circuit direction or landing area.</li> </ul>	<ul style="list-style-type: none"> <li>Not adapting circuit plan to fit with available height, wind, traffic etc</li> </ul>
<ul style="list-style-type: none"> <li>Too slow to configure for landing resulting in late checks and rushed planning</li> </ul>	<ul style="list-style-type: none"> <li>Give yourself time to plan the circuit; rehearse the actions and checks when not training.</li> </ul>

### HOW DO YOU DEMONSTRATE COMPETENCE?

- Consistently demonstrate when to return to the landing area with sufficient height to join circuit on arrival.
- Identify a clear landing area on airfield or suitable alternate if insufficient height to reach the airfield.
- Locating the landing area and identifying the best return path to avoid conflict with traffic and airspace.
- Ensuring you have adequate height to return to airfield in these conditions and determining the appropriate Circuit Joining Area and expected circuit direction to be used for selected landing area
- Selecting appropriate circuit direction and circuit joining area in accordance with airfield procedures, weather conditions and aircraft performance.
- Demonstrating situational awareness, including monitoring radio traffic.
- Adjusting your plan to accommodate traffic and other factors.
- Aircraft is configured for landing

### RESOURCES & REFERENCES

- Australian Gliding Knowledge Pages 116 -120
- AC 91-10 v1.1 Operations in the vicinity of non-controlled aerodromes  
<https://www.casa.gov.au/sites/default/files/2021-10/advisory-circular-91-10-operations-vicinity-noncontrolled-aerodromes.pdf>

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### SELF-CHECK QUESTIONS

Use these questions to test your knowledge of the unit.

- Explain the different mindset between Soaring Pilot and Landing Pilot.
- What are the possible impacts of not transiting to the landing area with sufficient height?
- What could influence you not to land into wind?
- How do you configure the glider for landing?