Gliding Australia Training Manual

Pilot Guide

Unit 9

Lookout Scan Procedures

Unit 9 - Lookout Scan Procedures

WHAT THIS UNIT IS ABOUT

To develop the skills and knowledge required to apply appropriate lookout procedures and scanning techniques.

WHAT ARE THE PRE-REQUISITES FOR THIS UNIT?

- GPC Unit 1 Lookout Awareness
- Theory Lesson 3

COMPLEMENTARY UNITS

This unit may be read in conjunction with:

- GPC Unit 21 Radio use and endorsement
- GPC Unit 22 Use of Situational Awareness Aids
- GPC Unit 31 Thermal Entry
- GPC Unit 32 Soaring with other gliders

KEY MESSAGES

- Lookout must be top priority at all times. This supports Situational Awareness where you are aware of all other traffic and can predict and avoid potential conflict situations.
- When communicating location of other traffic to a co-pilot, use the clock code.
- An effective lookout requires head movements, and focused attention, not just glances.
- Require different scan techniques for different circumstances.
- Alerted see-and-avoid is more effective than unalerted see-and-avoid, so radio must be monitored attentively and used wherever possible.

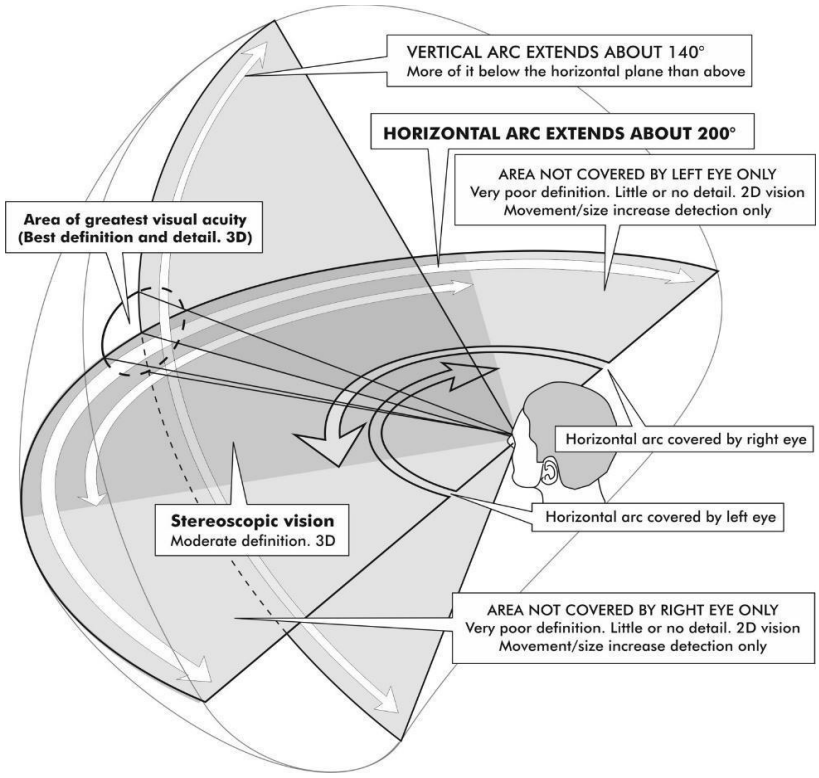
PILOT GUIDE FOR THIS UNIT

Notes

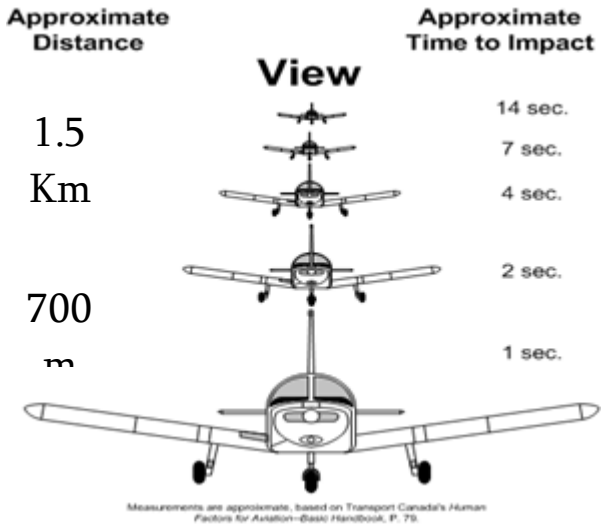
- Mid air collision is a high risk and can be managed through an effective lookout.
- The human eye has limitations and you must take actions to reduce these impacts. (see diagram below)
- If vision correction is needed, use spectacles and carry a spare pair.

Limitations of our vision

- The diagram below shows where it is possible to see.
- Now include barriers such as the instrument panel and cockpit walls and the wings, and your opportunity is greatly reduced.
- If you move your head and neck and bank the glider, you can see much more, and reduce conflict

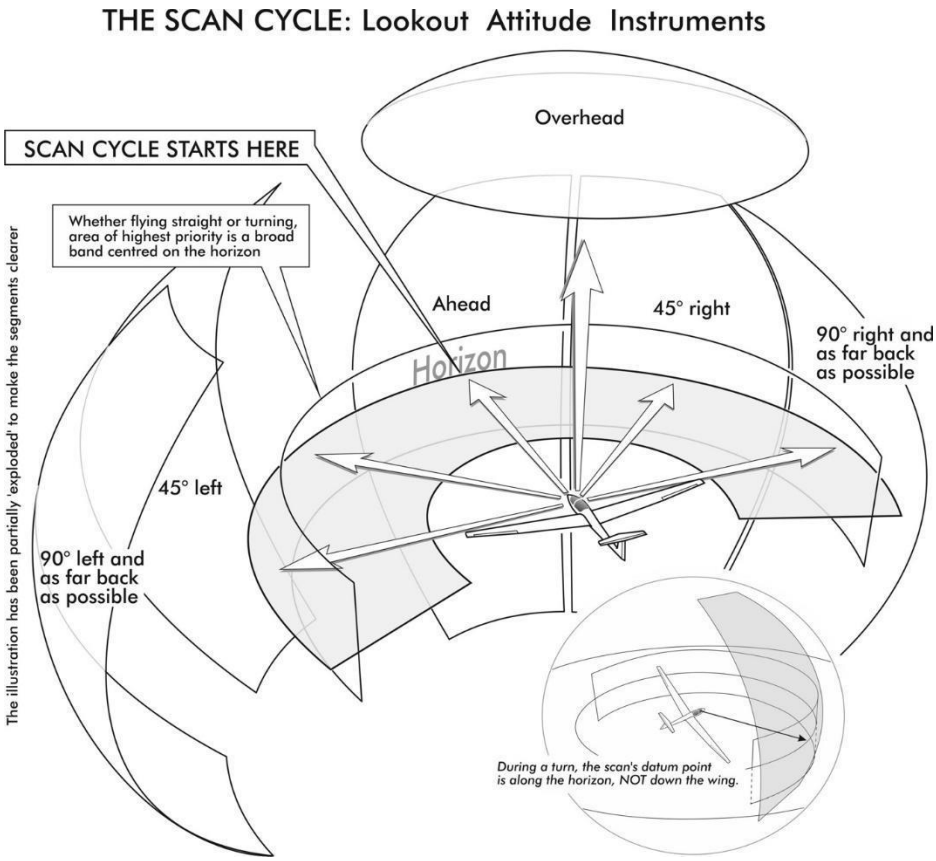


- To see an aircraft, you have to focus your eye on the area where it is or may be. This means that you have to look and focus then move to another area and look and focus, etc.
- We have scanning techniques to ensure that we look at the key places and focus on that area. A passing glance is not appropriate as the eye will not focus on the object
- Aircraft fly fast, 60 knots airspeed is approximately 120kph, so highway driving speed. A small speck a few Kilometres away can quickly become an aircraft that can collide with you in the time that it takes you to complete 2 circles in a thermal.
- The following picture gives you some idea of the problem. Note that closing speed is the sum of the speed of the two aircraft if flying directly towards each other.
- If one glider is circling then the time to impact is double what is shown here. Given that a single circle in a thermalling glider takes 15-20 seconds, you need to be aware of the other aircraft and increase your targeted scan as you circle because 1 turn later it will be too close.



The Scanning Technique:

1. FULL SCAN: A Systematic scan along the horizon from behind our left- wing tip, directly ahead through to behind our right- wing tip, Including the area above and below the horizon, and directly overhead our glider and below the glider. This will take a few minutes to do correctly and should be repeated regularly depending on traffic density.



We may also have aircraft coming from the side, across out flight path, or overtaking us on either side, so we also need to monitor these areas. The technique is to focusing on a spot for a few seconds, then moving our view 20-30 degrees ahead and repeating the process.

This **FULL SCAN** can be completed in stages, interrupted by a **CRUISING** scan or **TARGETED** scan as required.

2. CRUISING SCAN: When flying straight the most dangerous area is straight ahead and 60 degrees cone around the flight path, including the area above and below the horizon, We need to see aircraft in this region quickly so we can avoid any collisions risk. So we would focus on this cone of airspace (a CRUISING scan).

In situations where there is random traffic (cross country, training area, etc) it may pay to broaden the size of the Cruising Scan cone to 120 degrees.

3. TARGETED SCAN: This is where we focus on a smaller area which has potential increased traffic or greater risk. Examples include:

a Turning the glider. You will be turning into an area that you may not have had clear vision of previously. You start this scan by firstly looking in the opposite direction to the planned turn to identify threats from behind and the side, then scanning around the horizon through straight ahead and finishing at the area behind the wing in the direction you are turning. This will progressively let you see any aircraft that may be coming from behind you.

b Joining a thermal with other gliders. You need to identify all of the gliders in the thermal, not just the first one you see. Also look for other gliders that are also trying to join the thermal, they may come from any direction.

c Thermalling: Looking at the horizon in the direction of the turn to identify any aircraft that is approaching you. Remembering that it will be another 20 seconds before you see this view again so you need to identify potential conflicts so that you can monitor their movement.

d Leaving a thermal: Before straightening up to leave, first focus on the area outside the turn to detect if another glider is joining or overtaking in that area.

e Joining the circuit for landing: There is likely to be increased traffic, arriving from many different directions. You should conduct a TARGETED scan before you get to the circuit joining area so that you have better situational awareness of all gliders that may be in conflict with you. Monitor radio and visually identify any aircraft that calls.

Recommended Procedures

Be conscious of your Lookout responsibility 100% of the time. Set up your cockpit to maximise your time outside the cockpit. Instrument layout, GPS operation, map handling and etc. should be set up to allow maximum time looking outside

1. Use a scan technique appropriate to what you are doing. Good situation awareness is essential.

   Cruising Scan – Straight glides.

   Full Scan – Cruise scan plus appropriate priority to the flight situation, e.g. in circuit or when establishing climb in lift.

   Targeted Scan – Cruise scan plus targeted priority to the flight manoeuvre before initiating e.g. Pull-up into thermal.

2. Look in particular for turning gliders indicating a gaggle thermalling ahead.

3. Slow down before entering an identified area of lift especially if it already contains gliders.

4. In particular when pulling into a turn, remember that you have changed the situation significantly so you need to take primary responsibility for remaining clear of other gliders.

5. Particularly scan back along the tack direction when entering a thermal looking for expected and unexpected gliders on that same track.

6. Because gliders around us will sometimes be easy to see and other times will disappear as we look, it is necessary to make a conscious effort to maintain situation awareness – i.e. keep track of the gliders around you and what they are doing.

7. Remember modern gliders in particular have high energy. Speeds are high. Height gain in pull-ups is significant, and rapid.

Physiological Effects

Finally, be aware of and allow for the effects age, fatigue, low blood sugar, dehydration and mild anoxia. If you have any of these be sure to concentrate more than ever on technique.

FLIGHT EXERCISES FOR THIS UNIT

Using Full Scan

- Your instructor will demonstrate a full scan, describing where you are looking and the pace of progressing around the horizon.
- Your instructor will emphasise the need to move your head and to focus for a few seconds at each step.

Using Cruise Scan

- Your instructor will demonstrate flying towards a prominent landmark, or back to the airfield. Whilst flying straight you will be shown how you conduct the Cruising Scan. This will be focusing on a cone directly ahead which spans say 30 degrees each side of the direction of flight.
- Where the traffic pattern is random (lone cross-country or in the terminal area, i.e. local soaring) concentrate the scan on straight ahead and then to about 60 degrees to each side. When flying fast, concentrate more on straight ahead; when flying slower expand the area of concentration.

Using Targeted Scan.

- This will be delivered over a series of flights and repeated/assessed often. Entering a Turn and entering the circuit can be described on every flight.
- The terminal area (within, say, 5 miles) at a crowded site is a high traffic area with random traffic. This is particularly dangerous airspace and lookout needs to be excellent. High speeds in this area are not appropriate.
- Gliders on a reciprocal heading are very difficult to see. Avoid such circumstances and where this is not possible, take special care.

Other Considerations:

- Your instructor will show you the glider's blind spots; for example, following another directly astern and higher. The glider that is behind and can see the glider ahead is responsible to maintain separation.
- A glider doing a pull-up can be in a double blind situation where you cannot see the glider above and behind you, and you may be below the nose of the glider behind you and therefore not visible to it– there is no obvious fix for this so prevention is the only defence.
- Avoid flying directly above or below another glider with less than 500 ft clearance.

THINGS YOU MIGHT HAVE DIFFICULTY WITH

COMMON PROBLEMS

Initially getting used to the rate of scanning and developing the skill to apply the appropriate scan to suit the situation.

Failure to move your head and neck. Eye movement is not sufficient

HOW DO YOU DEMONSTRATE COMPETENCE?

- By demonstrating Full Scan, Cruising Scan and Targeted Scan as appropriate at all times.

.RESOURCES & REFERENCES

- Theory Lesson 3
- Australian Gliding Knowledge pages 240-246
- MoSP Part 2 Operations
- GFA Human Factors Manual (OPS 0010) – refer Limitations of the eye.

SELF-CHECK QUESTIONS

Use these questions to test your knowledge of the unit.

- When an aircraft reports its position relative to you what type of scan would you use?
- When flying between thermals in a straight-line, what type of scan would you use?
- What is the recommended scan cone in the cruising scan?