

# **Gliding Australia Training Manual**

## **Trainer Guide**



### **Unit 22**

#### **Use of Situational Awareness Aids**

### AIM

The aim of this GPC Unit is to enable the student to:

- Describe the operation of the different electronic aids to situational awareness available to the pilot.
- Demonstrate the effective use of situational aids in combination with effective lookout procedures.
- Describe the limitations of electronic situational awareness aids.
- Describe the operation of a range of electronic aids to situational awareness and their use in supporting effective lookout; and to describe the limitations of these aids.

### PREREQUISITE UNITS

- GPC Unit 9 – Lookout Scan Procedures
- GPC Unit 21 – Radio Use and Endorsement

### COMPLEMENTARY UNITS

- GPC Unit 39 – Advanced Soaring Instruments and Flight Computers

## COMPETENCY ELEMENTS AND PERFORMANCE STANDARDS

ELEMENT	PERFORMANCE STANDARDS
1. Knowledge of different situational awareness aids.	<ul style="list-style-type: none"> <li>• <b>Describe:</b> <ul style="list-style-type: none"> <li>○ Different types of situational awareness aids available to glider pilots.</li> <li>○ The basic principles of how these situational awareness devices operate.</li> </ul> </li> </ul>
2. Effectively use different situational awareness aids.	<ul style="list-style-type: none"> <li>• <b>Describe:</b> <ul style="list-style-type: none"> <li>○ How these situational awareness aids must be used in conjunction with other situational awareness processes.</li> <li>○ The setup of situational awareness aids available to the pilot.</li> <li>○ How to interpret and respond to information provided by the situational awareness aids.</li> </ul> </li> </ul>
3. Mitigate the limitations of situational awareness aids.	<ul style="list-style-type: none"> <li>• <b>Describe:</b> <ul style="list-style-type: none"> <li>○ The limitations of electronic situational awareness aids, in particular the threats associated with: <ul style="list-style-type: none"> <li>• Incorrect configuration.</li> <li>• Incorrect calibration or updates.</li> <li>• Loss of electrical power.</li> <li>• Readability of displays.</li> <li>• Sterile cockpit operations.</li> <li>• Distraction from the primacy of lookout.</li> </ul> </li> </ul> </li> </ul>
<p><i>Different aircraft will be fitted with different electronic situational awareness aids.</i></p> <p><i>The student needs to be able to effectively operate the situational awareness aids that are present in the aircraft that they will be flying as well as understand the general principles for aids they may encounter in other situations.</i></p>	

### KEY MESSAGES

- Modern electronics and radio communications have delivered a variety of devices that can assist the pilot in obtaining and maintaining situational awareness.
- These devices are not perfect and have multiple failure modes. This means they are an adjunct to, not a replacement of the main situational awareness processes. Always maintain lookout as the primary means of maintaining situational awareness.
- Pilots need to understand how these devices operate, how they are configured and used, how to interpret the information they provide.
- Pilots also must understand their limitations and how to know that they are configured and operating correctly.
- These devices must not be allowed to distract from the prime duties to lookout, see and avoid.

### LESSON PLANNING AND CONDUCT

#### Classroom Briefing

There are different types of equipment providing aids to Situational Awareness. Each comes with different displays and configurations. The manual appropriate to the device used in the aircraft must be consulted for the correct setup, usage and diagnostic procedures.

These aids can (if working and configured correctly) aid situational awareness of other traffic.

The types of devices that aid in situational awareness include:

- Aeronautical Radio (VHF).
- Basic use of Aeronautical radio (VHF) is covered in GPC Unit 21.
- FLARM.
- Transponders (XPNDR).
- ADS-B (Automatic dependent surveillance–broadcast).
- Moving Map displays (discussed in GPC Unit 39).

#### Limitations of these devices

- Range of communications.
- Need for electrical power and the continuous drain on the aircraft's battery.
- Readability of displays / clarity of audio output.
- Trying to display complex data on a limited display area.
- The need for configuration and calibration.
- The need for regular updates for some devices.
- Failure due to overheating, display malfunction, radio failure, failure of equivalent device in other aircraft.

Note that there are two situational awareness aids that are always available that require no electricity and are free to use: the sun and the compass.

### Operation

For all device types – how to power cycle the device and how to determine that it is operating correctly.

For all devices – how to configure and determine the calibration and update status of the device.

### Personal Electronic Devices



- Oudie, iPad, iPhone, PDA, Tablets with Associated Soaring/Aviation software:
- SeeYou, XCSOar, LX Nav, WinPilot, Avplan, OzRunways (more operational detail in GPC 39).
- Tracking Equipment and Software: Spot; Skylines; OGN, Flightradar24.

Set up in pre-flight preparation so that minimal distracting input in-flight is required.

Refer to a Club Cross Country Coach for more in-depth tutoring in the available club equipment.

### Aircraft Equipment

Radio – correct frequency use, monitoring of broadcasts, responding only if required with information to avoid conflicts.



FLARM or POWERFLARM – as with FLARM plus Transponder targets.



Transponder (XPNDR) – ensure correct operation with correct mode and code set prior to take-off. Transponder indications received will be on a POWERFLARM or similar display. Air Traffic Control and TCAS equipped aircraft can view the glider so equipped.



ADS-B (Automatic dependent surveillance–broadcast) – New portable low-cost transceiver equipment has recently been approved by CASA. Air Traffic Control, TCAS equipped aircraft and Flightradar24 can track the glider so equipped.



Moving Map – how to distinguish and help avoid airspace and aircraft targets on the display.

### PRE-FLIGHT BRIEFING

- Ensure the situational awareness devices are operating correctly.
- Student to be shown how to check and configure the situational awareness devices, confirming the same during the pre-launch checklist 'I-instruments' item.

## Unit 22 - Use of Situational Awareness Aids

- On ground, note what indications may be provided from the situational awareness aids. Student to describe the information being displayed or received through radio broadcasts.

### FLIGHT EXERCISES

- In flight, note indications from situational awareness aids and confirm these represent actual situations. Demonstrate responses to these indications.
- Repeat demonstration as required depending on level of situational awareness indications received at that location with the installed instruments.

#### Student practice (under supervision)

- Student to verbalise the meaning if information is received from situational awareness devices to their trainer.
- Student to respond to situational awareness inputs as required to maintain situational awareness and provide conflict avoidance.

#### Notes:

- Use of training figures or computer simulations of instruments may be required to provide the student with some guidance on what to expect from instruments that are not mounted in the aircraft they fly.
- Ensure that the student maintains sufficient external look-out and awareness during all flight exercises.

### COMMON PROBLEMS

Problem	Probable Cause
<ul style="list-style-type: none"> <li>Failure to fully know the operating procedures for situational awareness displays.</li> </ul>	Encourage set and forget functionality, trying to change settings while flying could be detrimental to Lookout and Survivability!
<ul style="list-style-type: none"> <li>Student is 'head down' in the cockpit and failing to maintain an adequate lookout.</li> </ul>	Student is trying to understand what the instruments are conveying instead of looking out and using the instruments as an aid to SA. Reinforce the need for lookout.

### THREAT AND ERROR MANAGEMENT

- Focus of attention on the situational awareness device/s distracts from maintaining good SA.
- Situational awareness aids do not operate as expected due to incorrect setup, configuration or failure to apply updates.
- Situational awareness aids may reduce aircraft electrical power below effective level for use.
- Situational awareness aids are assumed to be working (or assumed to provide better capabilities than they actually do).

### TRAINING MATERIALS AND REFERENCES

- GPC Pilot Guide Unit 22