

## (OR Good Lookout is No Accident)

### SUMMARY

- **Train yourself to develop good scanning habits. Move your vision from focus point to focus point systematically; stopping long enough to identify a physical object such as a wingtip or feature on the horizon.**
- **In level flight the area from which a threat is most likely to emanate will be 45 deg to each side and 10 deg. above or below the horizon and can be scanned with modest untiring head movements. Give this area regular attention.**
- **When about to turn carefully scan the airspace into which you will be flying. When reducing speed check the airspace above you. When accelerating you have a blind spot beneath you.**
- **Except when one is turning, aircraft on a collision course start as a small stationary object and only increase in size rapidly when a collision is probably unavoidable.**
- **Minimise time looking inside the cockpit, arrange instruments thoughtfully, use an audio vario, remove obstructions to good vision such as a compass on top of the instrument panel and keep your canopy clean.**
- **Situational awareness. Keep a mental picture of the aircraft around you. To do this you must be very familiar with your aircraft, in current practice and unaffected by fatigue, hypoxia or lifestyle excesses**

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For every mid-air collision there are probably 500 near misses where gliders have unintentionally come within 15 metres of each other and 5,000 incidents where a pilots comfort zone has been compromised with an unintentional separation of less than 50 metres.

In virtually every instance at least one pilot should have had a clear view of the other glider, so why the depressing statistics?

No pilot willingly exposes himself to unnecessary risks and probably every pilot believes that his lookout is of an adequate standard. Obviously we are not getting it right. The GFA is to be commended for now placing extra emphasis on lookout. It is not good enough to exhort pilots to maintain a good lookout, they must know how to use their eyes effectively.

This article explores some of the optical factors involved as a help to developing an effective lookout program.

Our vision can be divided into three sections.

Foveal vision is that part of our eyesight which we use for examining detail and subtends less than 5deg.

Binocular vision covers the 60deg. straight ahead of our face and is enhanced by having the benefit of having the input from both eyes. Lets call this 60deg. our "field of vision".

Peripheral vision extends about 90deg. to each side. In this part of our eye the nerves to the brain are bundled in a way which precludes fine vision but picks up movement or difference in light intensity, such as a flashing light.

Read a comic strip. When looking at one picture we do not take in the next or proceeding pictures even though the whole page is well within our field of vision. Even when reading the words in a picture the adjoining figures are indistinct and not recognised.

Exactly the same happens with our distance vision. We see clearly the object which is the subject of our attention but anything else is not taken in unless it is moving or flashing in which case our eyes are automatically drawn to it. Unfortunately gliders on a collision course do not move on the canopy and only expand rapidly in size when they are so close that a collision is almost certain. The exception is when one of the gliders is turning.

How much time do we have to identify a possible hazard and take evasive action? Gliders cruise at between 25 and 50 metres per second. In a head on situation 1 kilometre can be covered in 10 seconds and it is only in the last few seconds that it expands from being a small mark on the canopy to a non-mistakeable unavoidable object. US Naval Aviation estimates the time taken to see an object, identify it as an aircraft, recognise collision risk, decide to take avoidance measures and delay due to reaction and aircraft inertia at 12.5 seconds.

It is obvious that looking away from where you are going for more than five seconds is fraught with risk. Tasks with an out and return content or POST

tasks where head-on situations can occur are best avoided. They are a disaster waiting to happen. Joining or flying with other gliders in close proximity obviously requires great attention and the time span that it is safe to be distracted from a careful lookout procedure is very short indeed.

Now let's identify some common lookout faults.

1. Spending too long looking at instruments. It helps to have ASI, Vario and GPS readouts at the top of the instrument panel. Can you change radio channels without looking? Most radios have a hard to read digital readout. Keeping our head in the cockpit for 10 seconds or more while changing channels is not an option. With memory channels pre-set them in an easy to identify order so that you can change channels without looking. Using an audio vario is a must when flying in or near thermals with other gliders. Learn to scan your GPS. They have arrows or bars showing if and how far you are off track. Scan these rather than read a digital heading.
2. Not looking into the airspace into which you are about to fly. Pretty obvious, but it happens all too often. Pilots start turning and then lookout, don't lookout before releasing from the tug (both ways to check the tugs airspace), don't look up as they reduce speed (most pilots continue to look straight ahead), or roll out of a turn without looking in the direction of the down going wing.
3. Fixation – probably the most common cause of mid-air incidents. We tend to spend too long studying a feature of interest to the detriment of looking where we are going and the airspace generally. Pilots who would not dream of driving a car at high speed without keeping their eyes on the road and only scan the rear vision mirror or side roads for a second or two before looking back at where they were going, seem quite happy to study clouds or the airfield on which they intend landing for 10 seconds or more while flying at speeds of up to 200 kph. Small wonder we have had a series of disasters near airfields and most incidents away from airfields are associated with pilots thinking lift not lookout in areas of thermal activity whether marked by clouds or otherwise.
4. Less common but not unusual is the pilot, generally inexperienced, who almost continuously moves his head in a random fashion without carefully studying anything. He is concerned about lookout but is using his eyesight in an inefficient manner and would probably not identify an item of interest even though it was momentarily in his field of vision.

Lookout in relation to various aspects of flying

## Looking ahead

The time scales we have discussed emphasise the need to regularly monitor areas of interest. Firstly we must regularly move our eyes around our 60deg. field of vision to identify objects of interest. This is not a continuous flowing action but a movement, stop and focus, move again, stop and focus, etc. We only identify objects whilst our eyes are stopped and see virtually nothing when they are moving from point to point. A scan around our 60deg. Field of vision without moving our head will probably take about 6 seconds so it is impossible to scan the whole sky – it would take too long and we would stand a good chance of conflicting with something in front of us while we were scanning elsewhere, quite apart from getting a stiff neck and wearing out our concentration. When we are flying at a constant speed an aircraft on a conflicting course will be almost always on or very close to the horizon. Our looking-where-we-are-going lookout encompasses 10 deg. above and below the horizon (our view downward over the instrument panel is about 10 deg.)

and 45 deg. to each side, which is just outside our field of vision and only requires a small head movement to cover. This scan will not be tiring physically or mentally.

## Turning

When initiating a turn we should move our head enough to see the wingtip in the direction of the turn, carefully scan the airspace into which we will be flying and then look ahead again. Too many pilots move their heads from front to side at a rapid rate. Regular good looks are better. Once established, lookout in the direction of the turn about every 6 seconds.

## Speed changes

Many pilots continue to look straight ahead when pulling up and their vision is usually obstructed by a hat brim. A high risk bet that there is not a glider above and behind you. The same goes when accelerating quickly when leaving a thermal.

## Circuit area

Don't stare at the airfield! One good look should take no more than five seconds and then look ahead and to each side for traffic. You can think about what you saw on the airfield and then look back again. If you see another aircraft don't fixate on that either. It is the aircraft you haven't seen which will get you. Do a careful priority look both ways when joining down wind, base

and particularly final. Your downwind radio call should be made as you enter that leg so that aircraft about to join the circuit, perhaps further on than you, are aware of your position.

Sources of lift

Maintaining a careful scan is particularly important when studying clouds or turning gliders. If you study them for 10 seconds before scanning ahead and to each side then that is far too long. Have a good look and then think about what you saw while you are scanning for that other glider which may be also investigating the lift source and is similarly distracted.

Our duty of care

When two gliders are in close proximity (less than 1km apart) in competition flying, usually only one has, or should have, a clear view of the other. The safety and indeed lives of both pilots depends on the actions of the one with clear visibility.

If the other glider suddenly turns or pulls up will you be well clear?

Do you reduce speed before joining a glider in a thermal and fly in a manner so that the thermalling glider can see you?

Are you aware of the sudden changes of relative position which can occur on a strong day?

Are you situationally aware of gliders close by at all times?

Unfortunately many inexperienced pilots are not aware of just what constitutes safe separation until they are told by their irate friends – it is a skill which must be learnt. Take your duty of care seriously and be cautious.

Most en route accidents have occurred when following gliders have collided with thermalling or turning gliders. A turning glider has a restricted lookout to the outside of its turn and is relatively unmanouverable compared to a glider in level flight. A pilot following another glider has an especial responsibility to fly in a manner which will not endanger the leading glider. Being to one side requires vigilance for when the leading glider turns a conflicting situation can arise very quickly. It is necessary to fly sufficiently to one side ( not less than 150 meters) to allow the leading glider to turn without a conflict or to stay well back, about one kilometre. Better still fly alongside the leading glider,

exchange a friendly wave and gain his respect as a pilot who shares the lead rather than just leeching. Top competition pilots say there is nothing more worrying than to have following gliders fly just out of their sight, to one side, and relatively close.

A good lookout is essential but so too are safe flying manners. What you achieve on your next flight will only be a distant memory in a few years time. Just make sure you are around to enjoy it!

Harry Medicott