

THE GLIDING FEDERATION OF AUSTRALIA

OPERATIONS DIRECTIVE 1/04 – LOOKOUT TRAINING NOTES FOR INSTRUCTORS

Purpose

Operations Directive 1/03 introduced changed concepts in the way glider pilots are to conduct lookout procedures, with the intention of improving the overall effectiveness of lookout as the primary defence against collision risk in all flight situations.

These training notes are issued to assist and guide Instructors with the introduction of these procedures in practical flight training exercises.

Lookout procedures relating to “turning” and “pull-ups” have been chosen for these training notes for the following reasons:

1. They embody all of the scan techniques pilots are required to use, for easily identified reasons and at specific times during the manoeuvres.
2. Turns and pull-ups have been assessed as manoeuvres conducted by gliders that have the potential to bring about a conflict with other aircraft and therefore times when “see and avoid” is of paramount importance.
3. Lookout training for turns and pull-ups can (must) be taught at a very early stage of pilot training, thereby emphasising the primacy of “lookout”
4. The principles learned to adopt and maintain a safe lookout procedure during these manoeuvres are easily adapted to other flight situations.

It is worth analysing what lookout needs to achieve and why during these two manoeuvres before detailing the training exercise.

Turns:

A turn by definition results in a change of direction, it can be a slight change of heading, a full circle, or anywhere in between. This means that when a turn is initiated the relationship that exists with other aircraft that might be nearby changes, anywhere from slightly to dramatically. If a potential flight path conflict occurs action must be taken to make the situation safe. Seeing other aircraft is the first stage of this “see and avoid” procedure. Therefore, it is vital that the pilot has a lookout procedure that allows him/her to sight other aircraft before and during a turn.

Some examples:

- a) Two gliders flying at similar heights and speeds on the same heading, separated laterally by a distance of about 1km and with one ahead of the other by a similar distance, are not in any immediate danger of collision. However, if the leading glider turns through 90degrees and assumes a new heading towards the path of the oncoming glider, there is now a very real risk of a collision.
- b) Whenever a glider pilot finds lift and decides to climb in it by circling, his/her glider becomes effectively a stationary object in the sky and there is a potential for conflict with any other aircraft passing through **from any direction**. The pilot must have a lookout procedure that ensures his/her decision to stop and thermal does not bring about an unaccounted for conflict with other traffic.

Pull-ups:

A “pull-up” in this context is defined as a climb initiated by a pilot to reduce speed quickly by converting speed into a height gain. Unlike most other aircraft, gliders regularly employ this manoeuvre, it has the potential to quickly and dramatically change the relationship that exists between a glider and other aircraft and therefore it is a manoeuvre that requires a lookout procedure specifically designed to take account of these circumstances.

Scan Definitions

The three scan techniques below must be clearly understood by the student, if necessary, an explanation could precede the pre-flight briefings.

CRUISING SCAN – Forward conical scan 60 deg. left/right. Up and down.

This area ahead of the glider is a prime collision risk zone.

FULL SCAN – Complete visible sky scan.

A scan of all the airspace visible to the pilot from his/her position and orientation.

TARGETED SCAN – Scan concentrating on a specific area

Scans conducted of specific areas of the sky, at designated times and for specific reasons.

Lookout Training Exercise 1 – Turns

Note: The following exercise should be introduced as soon as the Instructor considers that the student is comfortable enough to conduct the scans and before the student has been introduced to turn training.

With the instructor flying, it is suggested that the glider be flown in straight and level flight for a period of at least 30 seconds before the turn is commenced. The turn should be kept to no more than a moderate angle of bank, to allow the student time to carry out

his/her lookout procedure and fully understand when and where to look at each stage of the sequence.

There is normally sufficient time to conduct the training exercise when the glider is allowed to turn through 90 degrees before rolling out onto a new heading, however, if the instructor feels that more time is required then the turn should be extended, as appropriate.

Pre-flight Briefing

A vital component of the exercise is to train the student how to scan the area of the sky that has been hidden from view behind the glider before the turn was commenced. To do so the pilot must look into this area as soon as it becomes visible to him/her. Students will often not look further back than the wing tip. To emphasise the importance of looking back as far as possible, the student should be seated in the glider on the ground with the right wing tip down and the instructor then walk to a position of about 4-5 O'clock and ask the student to look for him/her. It should be emphasised that this is where a threat might first appear and by turning to look back over his/her shoulder as far as is comfortably possible, will ensure that any threat is seen and assessed as soon as possible.

The intended flight exercise should then be explained

Example patter:

On this flight, I am going to take you through the lookout procedures for turns. Before we begin the exercise we will have been flying in straight and level flight for a period of time and will have been conducting an appropriate lookout procedure for that mode of flight – CRUISING SCAN with regular FULL SCANS – any other aircraft in our area and within our field of vision should therefore have been located and we will have decided it is safe to initiate the turn we want to make, however, before we initiate the turn we will conduct another brief FULL SCAN followed by a TARGETED SCAN with our target area being the airspace in the direction we intend to turn into. If satisfied that it is safe to turn, we will then roll into the turn, as the glider turns we will be aware that airspace that was blind to us, because it had behind us before we commenced the turn, will now be opening-up to our view. It is vital that this airspace be scanned carefully as the area progressively opens to our view – to do so we will conduct several TARGETED SCANS of this airspace until we are completely satisfied that any aircraft in this area will have been sighted, the hazard assessed and with appropriate action taken.

Before rolling out of our turn and assuming a new heading we must conduct another TARGETED SCAN with the target area being the airspace we will be entering. As we assume our new heading we will re-establish our - CRUISING SCAN with regular FULL SCAN - cruising lookout procedure.

If we had stayed in the turn, we would have progressively adopted an appropriate circling scan procedure.

Airborne demonstration

With the glider in straight and level flight and in appropriate circumstances, the exercise and pattern could be as follows:

As we talked about before we took-off, I will now take you through the lookout for turns exercise. We have been flying straight and level for a while now and I want to make a right (or left) turn and then straighten out on a new heading at a right angle to our present heading. We have been keeping a lookout and I believe that it is safe to turn, but before I do we will now do another brief full scan together, followed by a targeted scan on our right side looking carefully into the area our turn will take us – I am satisfied it is safe to turn, do you agree? (Wait for a response). I am now rolling into a right turn, as the glider turns we must be sure that we are not turning towards someone we have not been able to see – you are now able to see into a piece of the sky that we couldn't see before we turned, because it was behind us – look very carefully into it now, above and below, as well as at our level and repeat the scan as we come around the turn.

Now we are ready to roll out of the turn onto our new heading, do another targeted scan of the area ahead of us that we will be flying into – now that we are out of the turn and flying straight and level again, do a full scan and then we will go back to our cruising lookout.

Lookout Training Exercise 2 – Pull-ups

It is essential that the student appreciates that when a pull-up is conducted there can be a dramatic and rapid change in the relationship that exists with other aircraft, due to the glider moving vertically into new airspace.

With the Instructor flying, it is suggested that the glider be brought to a speed suitable to produce a gentle pull-up that can be sustained for a sufficiently long period of time to complete the following exercise. The speed required will vary depending on the glider type, but might typically be 70-75 Knots. It must of course be within the placarded speed range of the glider.

Whilst it is important that students be introduced to lookout procedures and training as early as possible, some students feel uncomfortable with this manoeuvre and there is little point in attempting to conduct the exercise in these circumstances. However, it should be conducted as soon as practicable after the Instructor has assessed that the student will be comfortable with the manoeuvre.

Pre-flight Briefing

Example patter:

On this flight, I am going to take you through the lookout procedure for pull-ups. Before we begin the exercise we will have been flying in straight and level flight for a period of time and will have been conducting an appropriate lookout procedure for that mode of flight – CRUISING SCAN with regular FULL SCANS – any other aircraft in our area and within our field of vision should therefore have been located. Provided that we agree it is safe, I will gently lower the nose and let the speed build to about 70-75 knots. We will then decide we want to reduce our speed markedly by pulling-up. Before we initiate the climb we must clear the airspace we will be flying into, to do this we will conduct a TARGETED SCAN of the area above and ahead of the glider. Although it is a TARGETED SCAN it needs to be fairly large in area, as we need to be aware that other aircraft could be entering the area, from any direction. If we are satisfied it is safe, I will initiate the climb, after commencing the climb, we will continue, or regularly repeat, the same TARGETED SCAN while we are climbing in the pull-up. As we level out at the top of the climb, we will conduct a FULL SCAN being very conscience that the manoeuvre we have just performed may not have been anticipated or noticed by other pilots, before re-establishing our - CRUISING SCAN with regular FULL SCAN – cruising lookout procedure.

Airborne demonstration

Note: When a pull-up is conducted in straight flight, there are areas particularly behind the glider that cannot be scanned before, during, or after the sequence. There must therefore be some reliance that following aircraft will “see and avoid”, however, an appropriate radio broadcast prior to initiating the climb is recommended to enhance safety.

With the glider in straight and level flight and in appropriate circumstances, the exercise and patter could be as follows:

As we talked about before we took-off, I will now take you through the lookout for pull-ups exercise. We have been maintaining a lookout and I am satisfied that it is safe to increase speed, do you agree? (Wait for a response). Now that we have reached the speed we wanted we are ready for the pull-up – before we begin our climb I want you to conduct a targeted scan with me of the area above us, looking carefully at and around the area ahead and above us that we will be climbing into. When both the Instructor and Student agree it is safe to do so, the instructor initiates a steady, moderate but purposeful climb. Now that we are climbing keep looking out, remember we are going up into new airspace. As I am now levelling out at the top of the climb – we will now conduct a careful full scan, be aware that we have changed our situation and it is possible that other pilots might not have noticed.

Conclusion

The above exercises should be repeated several times until the student fully understands how to conduct these lookout procedures. As they will be introduced at an early stage of pilot training, it is not expected that students will perform the lookout procedures with full competency, however, instructors must continue to monitor the student's lookout procedures and prompt when required to ensure that the competency level improves as their training progresses.

Kevin Olerhead,
Chief Technical Officer – Operations

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