

RPAS Visual Observer Knowledge

Version 6 - Updated 2024-05-15

- Updated speeds for Mavic 3 Enterprise

Visual Scanning:

Your primary task is to Detect and Avoid (DAA) other traffic. You must keep track of the RPAS at all times, while also staying alert for other air traffic. The visual observer will be beside the pilot to be in close communication.

- Keep your focus on an area for at least 1 second, and only move 10 degrees at a time.
- Scan the sky systematically
- Alert the Pilot in Command (PIC) of any hazards that could impact the operation
- Alert the PIC if you lose visual line of sight on the RPAS

Listening

- In addition to visual scanning, the VO will listen for aircraft
- If possible shut-off boat engine or other sources of noise
- Note if it is a low-flying aircraft or a jet
- Confer with PIC if you are uncertain

Traffic Direction and Location

- Use cardinal directions to identify the direction of traffic relative to the PIC and the RPAS
- You may also use well-known landmarks to assist in identifying the location of traffic
- Estimate the distance and speed of the traffic if possible
- Discuss with crew the cardinal directions, distances, and location prior to operation

Aircraft Detect and Avoid

- Determine if aircraft is a threat
 - Is it at an altitude where it could be a conflict?
 - Is it coming towards or away from the RPAS
- Inform the PIC of the aircraft location
- Inform the PIC of how to avoid the threat
 - Hold position OR
 - Travel in cardinal direction perpendicular to aircraft travel (both PIC and VO need to know which way is north) OR
 - Descend OR
 - Ascend (if the aircraft is below RPAS)
- Engage flight termination **ONLY IF LAST RESORT**

DAA Above 400'

- If traffic is heard - alert pilot to stop and descend
 - When direction/distance/altitude of traffic is determined, follow steps above

Bird detect and avoid

- If a bird of prey is spotted, notify the PIC of its location
- Note if the bird is a potential threat to the RPAS
- If it looks to attack, direct the PIC to take the RPAS vertically up, or down if that is not possible

Communication:

It is critical to communicate between the crew. Be sure to make a communications plan with the PIC before each flight. The VO should be within easy speaking distance of the PIC.

- Notify the PIC of any hazards to the RPAS, property, or persons
- Obey the commands of the PIC
- Maintain constant communication
- Have all emergency plans and checklists available

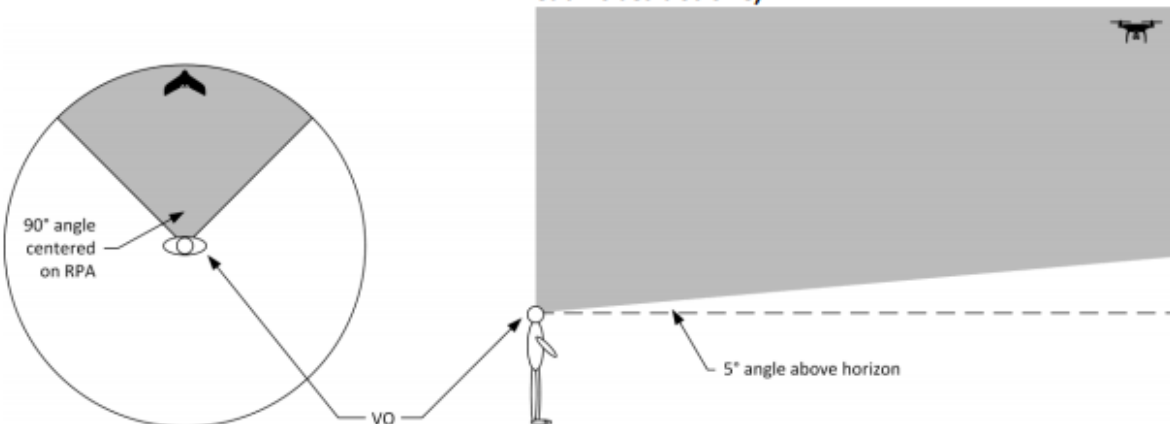
Line of sight and sun angle:

(from AC 903-001)

Ensure that there are no obstructions more than 5° above the horizon to allow a clear line of sight.

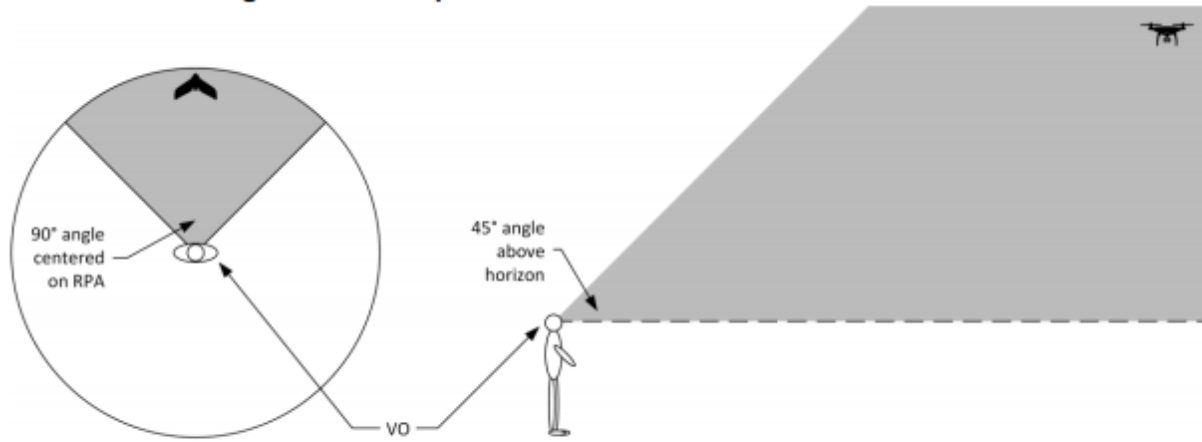
- A simple test is to stretch out your arm with your palm facing out. With your index finger on the horizon, the width of your hand should be 5°

Figure 13 – Visual Observer must have a clear line of sight throughout the shaded area (no visual obstructions)



To avoid looking into the sun, place the VO so that the sun is outside of the shaded areas in the diagram below

Figure 14 – Sun position must be located outside the shaded area



Hazardous Weather:

- Observer must be watching for signs of changing weather, especially high winds, precipitation, or CB activity
- Weather limits:
 - 2 Miles visibility
 - Ceiling 1000'
 - Winds not greater than 19kt
 - Precipitation not exceeding "light"
 - No wind shear, CB, frontal activity or other hazardous weather conditions
 - Temperature above 5°C

In the event of a collision:

If RPAS has crashed follow these steps:

1. Remain calm
2. RPAS pilot, spotter, and other crew should move to the estimated crash site with safety kit (first aid kit, fire extinguisher, tools, net, bags, etc).
3. Locate crash site using last known location or use controller GPS map / camera / listen.
4. Once the crash site is found ensure it is safe to approach. Ensure no public is in the area (create a perimeter from the public).
5. Ensure the RPAS is turned off and place jacket or netting over the props to ensure they do not turn on and injure anyone.
6. Once under control contact Hakai Operations Base on marine VHF channel 6. If the situation is still dangerous contact the coast guard on marine VHF channel 16. Send for assistance.
7. Use a fire extinguisher if required.
8. Remove battery if safe.

9. Record the incident with a camera and log full details.
10. Collect contact information with witnesses and victims.
11. Clean the site.
12. Ensure the Operations Manager and authorities have been notified of the incident.
13. If RPAS has not been found - report it with the police / coast guard and post written notices and contact information if found.

Operation boundaries

Prior to the operation, learn the vertical and horizontal boundaries of the operation. During the operation, inform the PIC if you think that the RPAS is exceeding the elevation or area boundaries.

Airspace class

We will be primarily flying in class "G" unrestricted airspace. The PIC will inform you of any other nearby airspace to avoid.

While in this airspace, we need to stay clear of clouds, and only fly with 2 miles visibility.

Right of way

In all cases, the RPAS **MUST** give way to manned aircraft.

- The RPAS must be a lateral distance of more than 100ft from any person not associated with the operation
- Must not fly over any open-air assembly of persons

System limitations

You should know the following limitations of the RPAS:

- Max Ascent Speed 6m/s
- Max Descent Speed 5 m/s
- Max Speed 20 m/s
- Max Flight Time 45 minutes (35 minutes working time)
- Operating temperature 0-40 degrees C
- Range - the RPAS should remain within visual line-of-sight (VLOS)