



RISK MITIGATIONS

DRONE PILOT COURSE

GROUND RISK

The ground risk of an UAS operation is defined as the risk of a person being hit by the unmanned aircraft in the event of loss of control.

There are a series of factors that determine the risk on land of an operation, these can be, among others:

1. The maximum characteristic dimension of the unmanned aircraft.
2. Operation within or beyond visual range.
3. The population density in the area of operations.



GROUND RISK

GROUND RISK ASSESSMENT

In relation to the technical and operational mitigations of the risk on the ground, before an operation the remote pilot must consider:

1. The existence of obstacles in the operating environment;
2. The direction and speed of the wind;
3. The existence of safe places for takeoff and landing.

MITIGATION MEASURES

Among the risk mitigation measures on land we can highlight:

1. The installation of an impact energy limitation system (parachutes installed on the UAS);
2. That the operation is carried out in a controlled operation area;
3. Define a contingency zone or a risk prevention zone on land;
4. That the UAS has a return to home (RTH) function.

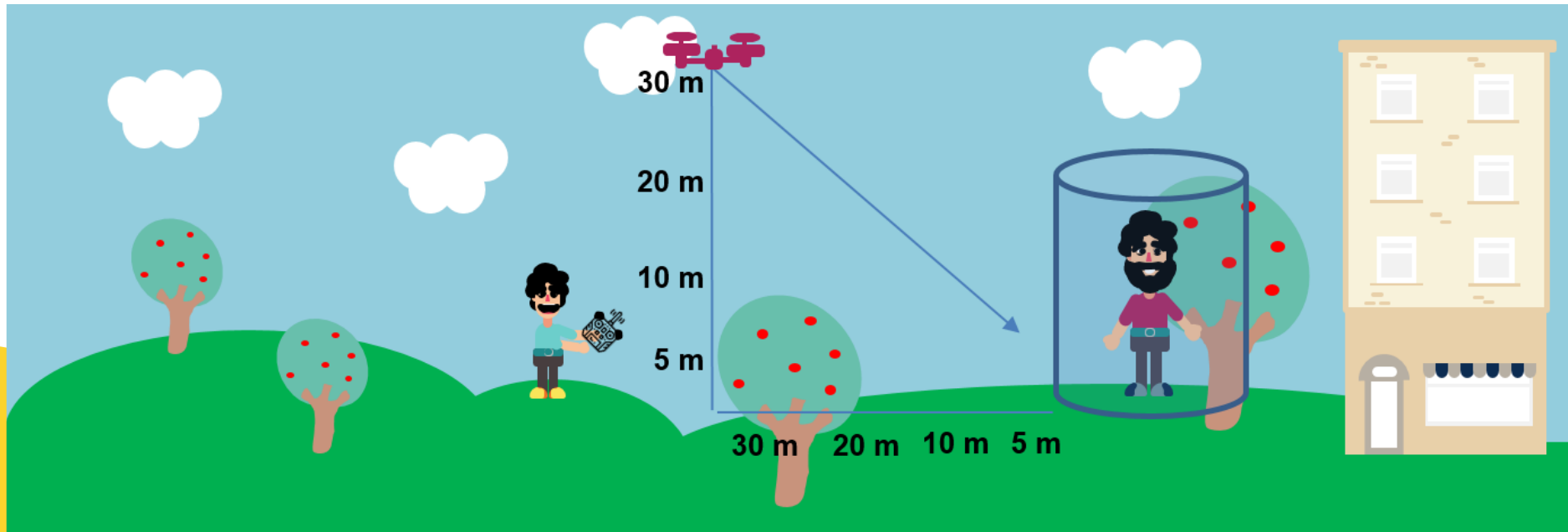
GROUND RISK

LOW SPEED MODE FUNCTION

An unmanned aircraft is considered to be flying in low speed mode when the maximum allowed speed is 3 m/s.

If a flight is made in subcategory A2 without activating the low speed mode, the minimum horizontal safety distance with people not participating in the operation will be 30 meters.

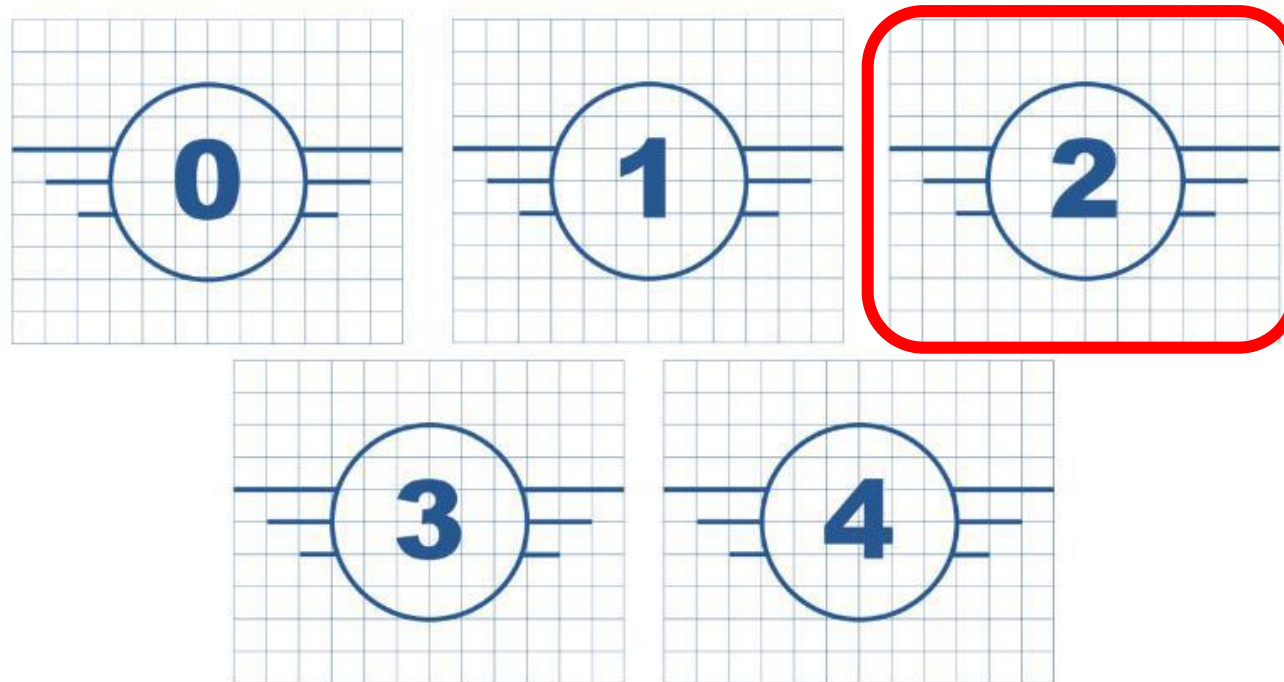
If a flight is made in subcategory A2 with the low speed mode activated, the minimum horizontal safety distance with people not participating in the operation will be calculated following the 1:1 rule (never less than 5 m).



GROUND RISK

LOW SPEED MODE FUNCTION

The permitted class identification label for operations in subcategory A2 is C2.



GROUND RISK

LOW SPEED MODE FUNCTION

Flights in subcategory A2 of the "open" category may be carried out with UASs that have a class C2 identification label and must meet the following requirements.

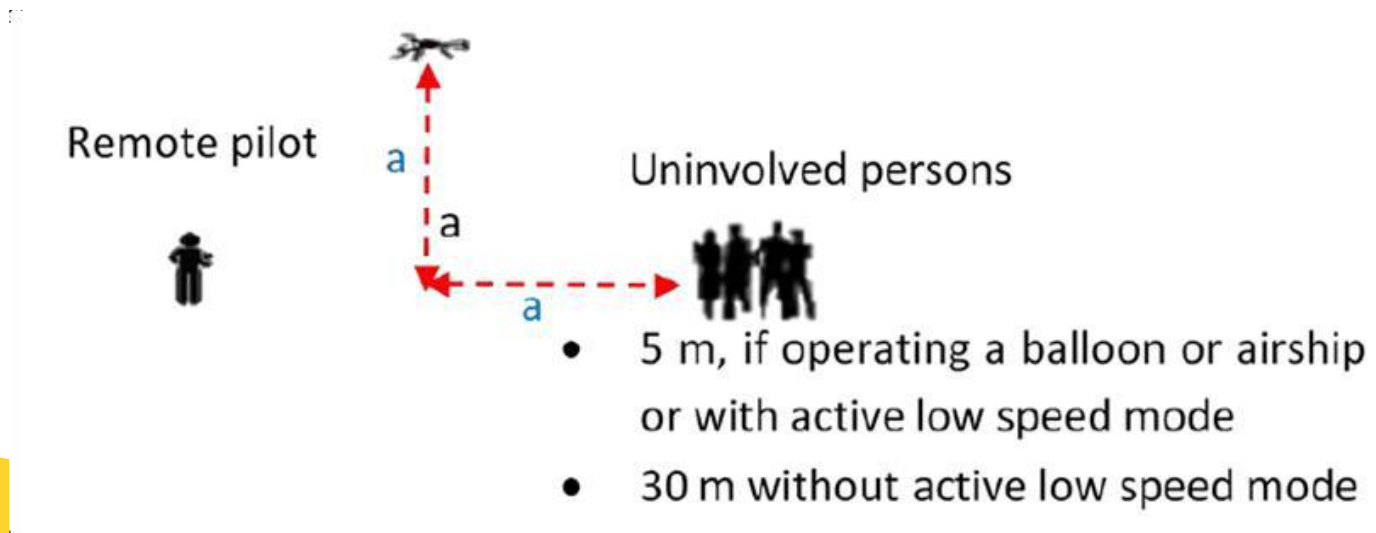
DO	DO NOT
 Make sure you are adequately insured	 Do not make changes to the drone, unless approved by the manufacturer
 Check your drone before each flight	 Do not fly higher than 120 m from the ground ¹
 Plan your flight	 Do not fly near manned aircraft
 Make sure the electronic identification and geo-awareness system of your drone is up-to-date	 Do not fly in the proximity of airports, helipads, areas affecting public safety or where an emergency response effort is ongoing
 Before each flight, check the limitations of the area where you want to operate, defined by the National Authority of that country, and respect them	 Do not fly over sensitive or protected sites (prisons, military bases, power plants, etc.)
 Familiarise yourself with the area where you want to operate your drone	 Do not use the drone to carry dangerous goods
 Check the weather conditions	 When flying over other people's property, do not fly less than 20 m above the property without their permission
 Keep the drone in sight at all times	 Do not take photographs, videos or sound recordings of people without their permission. Respect people's privacy
 Maintain a safe distance between the drone and people, animals and other aircraft	
 When flying close to people, activate the low speed mode and keep a horizontal distance from them of at least the height of the drone (1:1 rule), but never less than 5m	
 Operate your drone within the performance limitations defined in the instructions provided by the manufacturer	

Disclaimer: This document is a working document and is provided for

GROUND RISK

LOW SPEED MODE FUNCTION

- **TRANSITIONAL PERIOD:** Due to the fact that there are still no UAS with a class identification tag, a transitional period is established until January 1, 2023 in which UAS without a class identification tag can be used in A2 as long as its MTOM is less than 2 kg.
- **DISTANCE ASSESSMENT:** Operations in A2 are those in which you fly close to people not involved in the operation, maintaining a safety distance of 30 m (reducible to 5 m if the low speed mode function is activated).



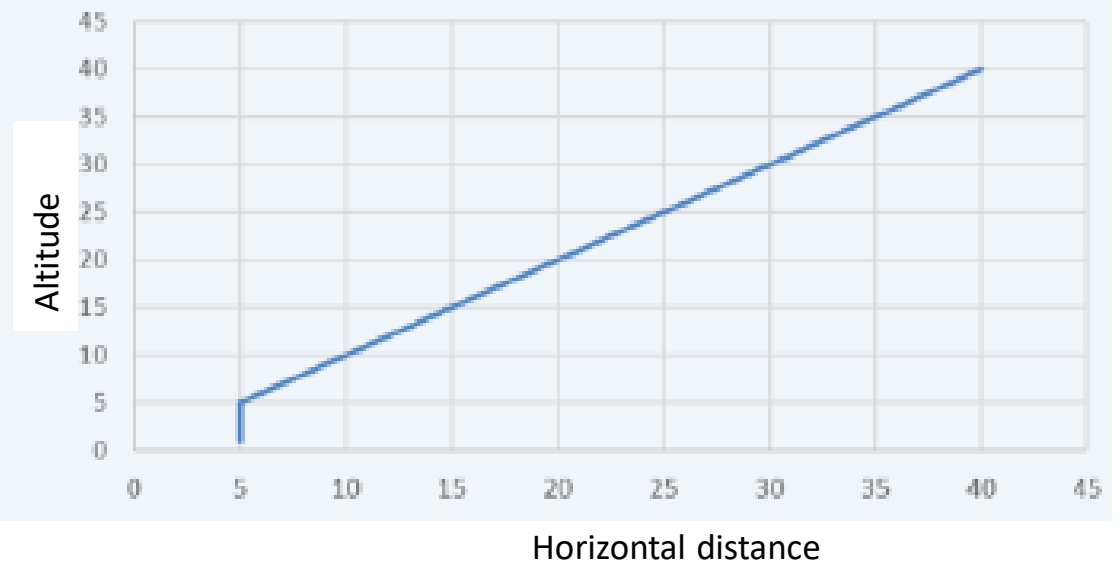
GROUND RISK

LOW SPEED MODE FUNCTION

NO Low Speed Mode



Low Speed Mode Activated



As can be seen in the graph to the left, without the UA's low-speed mode activated, both the height and the closest horizontal distance to a person not participating in the operation must always be greater than 30 m.

GROUND RISK

EVALUATION OF THE DISTANCE TO NON-PARTICIPANTS

Examples of people who are considered NON-PARTICIPANTS in the operation:

1. People sitting in a park in the area of operations.
2. People present at a music festival, informed through a statement on the entrance ticket.
3. People present in the area of operations, but who do not want to participate in it.

Examples of people who are considered PARTICIPANTS in the operation:

1. An unmanned aircraft observer positioned next to the pilot.
2. A UAS operator worker who is blocking access to the area of operations.

GROUND RISK

1:1 RULE

The 1:1 rule is a simple but useful way to remember how far away the UA should be from non-participants.

- Up to 30 m high, the minimum horizontal distance must be 30 m.
- If the low speed mode is activated, up to 5 m high, the minimum horizontal distance will be 5 m.
- Above these limits, the horizontal distance must be equal to the flight height.
- For example, at a height of 50 m, a horizontal distance of 50 m must be maintained from non-participants.

What horizontal distance must be maintained if I fly at a height of 20 m?

It depends:

- If low speed mode is NOT activated, 30 m (minimum).
- If low speed mode is activated, 20 m (1:1 rule).



Thanks for your attention

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