

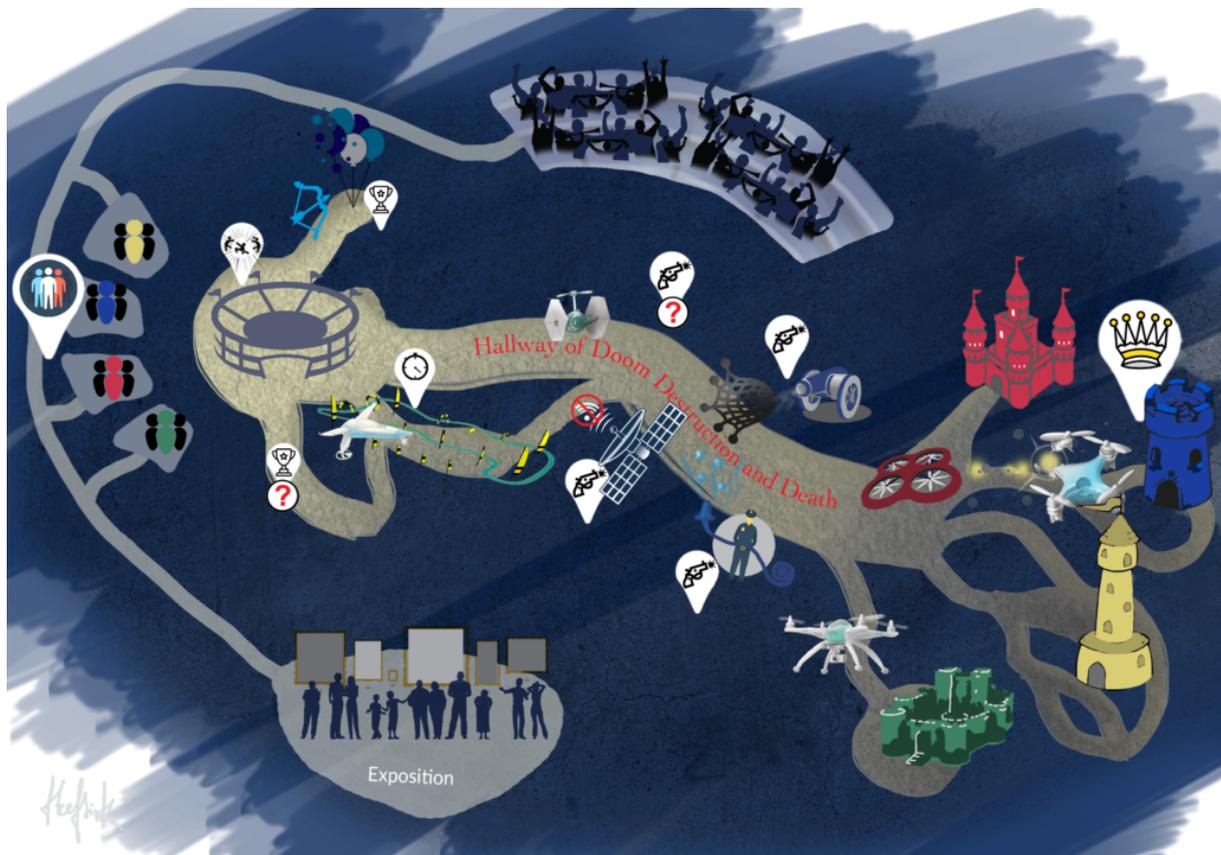
# DroneClash

Team Guidelines and Rules  
v2.3

## The game

The goal is to battle the other teams, and earn points while doing it. Each team is allowed as many drones as they like, but they should bring at least one Fighter drone, and one Queen drone. Teams are provided with **only TWO FPV race frequency bands**, and are not allowed to change this frequency or jam other teams. The main idea is simple: bring down the rival Queens with your Fighters. How? That's up to you!

There are however some complications, as can be seen in the map below.



The Fighters start in the **Battle-1st Arena**, while the Queens are peacefully hovering in the **Queens-Palace**. Queens are not allowed to leave their corner of the Palace, Fighters have to come a treacherous way to get to the Queens. The Battle-1st Arena and the Queens Palace are separated by a tunnel: the **3D Hallway**. Why 3D...? Well, because its full name, The Hallway of Doom Death and Destruction, sounds rather horrendous...

As you might have guessed by now, the competition takes place indoor.

## Law Enforcement

Law Enforcement is tough, fair, and all that... but lately they have had some issues with all these rogue drones that keep popping up in the media. Some are mere toys that fell in inexperienced hands, some fell in way worse hands...

To practise their equipment, and their resolve for that matter, Law Enforcement has placed all kinds of nasty tricks in the 3D Hallway. Not all is known at the moment, but teams may expect there will be an automatic anti-drone net cannon, a smoke cannon, and a blinding light. These devices will be automatically turned on in random intervals.

Law Enforcement also acts as the Judge and Jury. Points that are earned are assigned by the Jury.

## Safety

Generally, the amount of restrictions are minimized. However, in the end we need to account for safety of the audience and participants. The audience is protected by nets and polycarbonate glass around the fighting pits, but teams will have to propose a safety analysis document on how they can guarantee limitations of the dangers. Of course, besides our competition Law Enforcement, teams also need to operate within the real Dutch laws (including rc frequencies and such).

## Points

In the end, it's all about points. Points can be earned during the competition by performing several types of drone battles, and of course by bringing down the Queens. This means, aggressive battle teams who did not defeat a Queen, can still win the game. Points are awarded by Law Enforcement. Earning points can be done in the following ways.

Action	Reward
Hitting a rival drone	50 points
Permanently grounding a rival drone	500 points
Catching a rival drone out of the air and holding it for at least 3 seconds	5000 points
Catching a rival drone out of the air and deliver safely in a container	50000 points
Rival queen takedown	15000 points

## Prizes

After the competition has ended, several prizes are awarded. Based on the amount of points earned, the best overall teams are selected. The best team wins DroneClash and receives €30.000,-, the second team will receive €5.000,- and the third team will receive €2.500,-.

Furthermore, there will be bonus prizes for:

- The autonomous team award: €5.000.
- The innovative team award: €5.000.
- The best pilot award: €2.500.

The autonomous team and the innovative team award are based on a Law Enforcement vote. The best pilot award is an audience award, meaning the audience will decide who wins it.

**Important remark:** due to nature of our financial agreement with our sponsors, we can only award the prize money if at least a predetermined number of teams subscribe. We will release a statement whether this goal was achieved shortly after the team's subscribe deadline has passed.

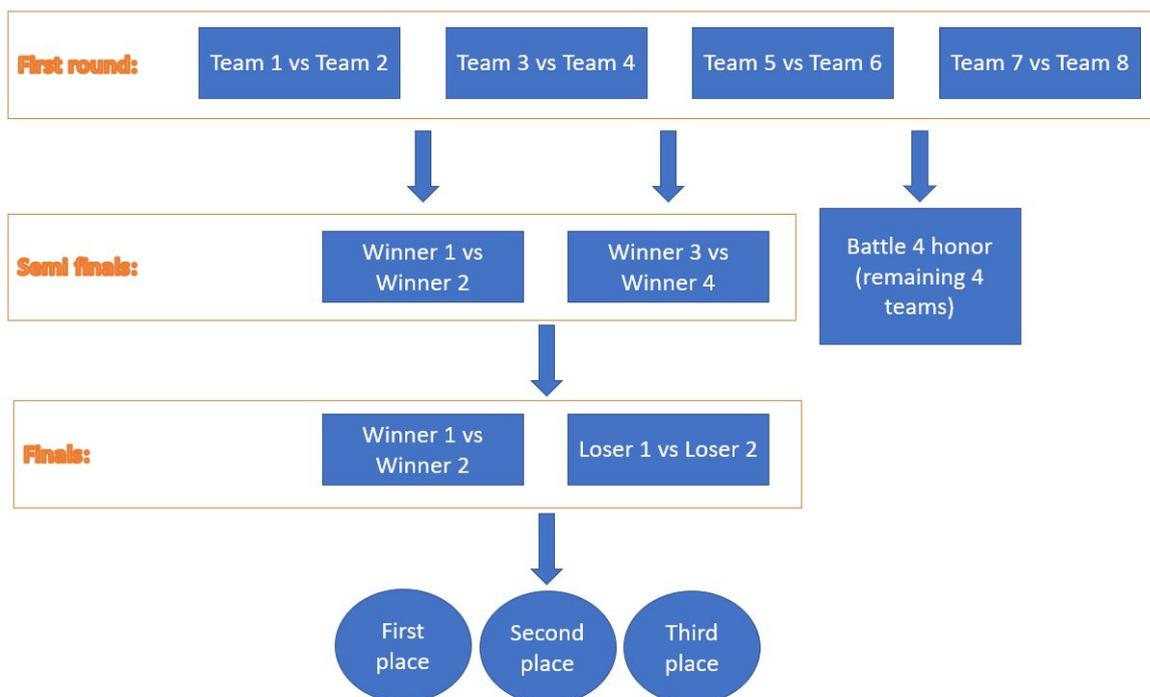
## Rules

1. Two, three or four teams have to battle each other in the same match.
2. The teams are provided with two FPV frequency bands per team. Teams are allowed multiple drones, but they have to figure out themselves how to cope with the fact that they have only two video channels available (e.g. autonomous drones, backup drones on the ground that are not transmitting yet,...). The team members will have a direct visual on the drones, so Line Of Sight flight will be possible. There is one exception: teams will have no visual in the Hallway, so FPV flight is actually required to get to the Queens.
3. The FPV video streams will be shown on the big screens so spectators are able to see what the pilot sees.
4. At the start of the competition teams will have to place all their drones in the respective team areas of the arenas. Once a drone is unable to take off without physical human interaction that drone is out of the game.
5. Between rounds drones can be repaired for the upcoming round, but the same drones are to be used for each round.
6. Teams are awarded points by the judges in Law Enforcement.
7. Teams must bring
  - a. 1 Queen drone
  - b. at least 1 Fighter drone.
  - c. optional: Defender drones
8. The Queen drone must fly at all times, but she is not allowed to (partly) leave her designated area in the Queen's Palace. If she does, she must land and is not allowed to take off again. The same rule applies to the ground and the roof: if the queen touches these, she must land immediately and permanently.
9. If the Queen drone is down (landed, crashed, intentionally or not), this team cannot earn additional points. However, the battle is not over. The other team(s) can still score points by attacking your drones. You are still allowed to defend yourself, i.e. attempt to prevent the other team from scoring points.

10. Defender drones are also not allowed outside of the team's designated Queen area, but they are allowed to temporarily land. When landed, they are not allowed to attack other drones in any way.
11. Drones must be flying when attacking. No ground based weapons are allowed, including defensive weapons.
12. Drones are not allowed to be tethered to the ground, e.g. for anchoring or external powering purposes.
13. Outside of the following limitations, teams are left free to design weapons as they see fit:
  - a. Hostile overtaking (hacking) is only allowed when the team has a flying **fighter** drone. Hacking into the transmissions is also allowed, as long as it is not done by simply overpowering or jamming the original signal (see b).
  - b. Teams may not use electromagnetic interference or jamming to interfere or overpower transmission signals of other teams. These signals include video, RC and datalink transmissions.
  - c. All Race band FPV transmitters are allowed, but it will be checked whether they are not disturbing other channels. The ImmersionRC Tramp HV is exempted from this test, as it is known to be good. A ImmersionRC Wand will be available.
  - d. Teams are not allowed to demolish (parts of) the arena.
  - e. Teams must proof in a safety analysis their weapons cannot harm spectators or participants
14. The jury has the power to penalize or disqualify teams in case of misbehavior or unsportsmanship.

## Tournament structure

The DroneClash tournament structure is as follows:



The first round has four battles. Each battle has 2 teams that battle against each other.

Which team enter which battle in the first round is determined by a lottery. In case of a team drop out, the other (non-dropout) team will be inserted in another battle from the first round, making it a three team battle. If that is no longer possible because it was the last battle of the first round, the non-dropout team automatically qualifies for the semi finals. To determine which battle the non-dropout team needs to be inserted in, the Jury uses the points scored from D1 and D2: the battle with the least amount of combined points (and still has to battle) will receive the non-dropout team.

The semi finals contains two battles of each two teams, that were all winners of the first round battles. In case of a drop-out team, this team will be replaced by the team with the highest D1 and D2 score.

All four losers of the first round will battle in the Battle 4 Honor. (Except for the case of a drop-out in the semi finals, a team will be promoted to the semi final and not be included in the Battle 4 Honor.)

The final round is again two battles battle of each two teams: the winners of the semi finals are pitted against each other in the final battle, and the losers of the semi finals in the consolidation battle. At the start of the round (which is the consolidation battle), all teams are asked whether they need to drop-out. If they are not fly ready (i.e. dropping out), the winner of the Battle 4 Honor is placed in the consolidation round. The remaining finalist teams are moved up accordingly.

## How to participate?

Read everything above and still enthusiastic!? Good, these are the steps required to join the competition.

1. Subscribe your team on [droneclash.nl](http://droneclash.nl), **before 15 November**. The costs are **€150** per team. This does not cover all our costs, but we do ask this small amount to make sure the teams are serious about subscribing.
2. We will contact you by email, planning a short team interview by Skype.
3. Deliverable 1 is due on November 30. It should describe the general approach your team wishes to take, and a detailed safety analysis and requirements document.
4. Deliverable 2 is due on January 15. We require a video demo of the general approach, and a well oiled team. This video will be made public.

Deliverables 1 and 2 are each rewarded with points by Law Enforcement, up to a max of 1000 points per deliverable.

## Final remark

This document is not final. Small iterations of improvements will be made during as information becomes available. Pointing out loopholes to the organisation in this document, or any future changes, is much obliged.

## Change log

- v0.8 First public release
- v0.8.1 Changed logo
- v0.8.2 Updated deadline dates
- v0.9 Allow LOS flight in the arenas. (Still requires FPV in the 3D Hallway)  
Changed points of queen take down.  
Two FPV frequency bands per team.  
Three teams battle simultaneously instead of four teams.

- The challenges are no more, counter measures turn on in random intervals.  
Updated deadline dates, again.
- v1.0 Prizes  
Fixed some consistency problems caused by v0.9 changes  
Clarified rule 10
  - v2.0 Two, three or four teams battle simultaneously instead of only three or four teams.  
Slightly changed and clarified the definition of jamming.  
Allow hacking.  
Jamming will no longer be among the used countermeasures by Law Enforcement.  
Removed ambiguous "all" from rule 11.
  - v2.1 Allowed all proper FPV gear, recommend Immersions RC Tramp HV  
Drones can only be repaired in between rounds, not adapted.  
Added a rule about penalizing power of the jury  
Clarified what happens when queen leaves here zone.  
Noted that also defensive ground based weapons are not allowed.
  - v2.2 Clarified rule 8 and 9.
  - v2.3 Clarified rule 8 again.  
Extended and clarified rule 9.  
Extended rule 13c.  
Added tournament placings and dropout strategy.