

## **Australian Drone Nationals Race Rules**

Effective 31<sup>st</sup> March 2017

Version 1.6

### **Preface**

These racing rules cover all methods of FPV racing held by the Australian FPV Racing Association, (AFPVRA) effective from 31<sup>st</sup> March 2017 and effective until further notice.

### **Contents**

- 1. Terminology & Definitions**
- 2. Racing Class: *Open Class***  
*Definition*
- 3. Aircraft Scrutineering**  
*Overall/Safety inspection*  
*ACMA compliance*  
*Class compliance*  
*Additional racing compliance*
- 4. Flight Operations**  
*Flight Director*  
*Pit Marshall*  
*Track Marshall*  
*Spotter*  
*Race Officials*  
*Track Setup*  
*Practice*  
*Video Frequency Use/ Testing & Channel Changing*  
*Racing*
- 5. Racing Rules**  
*Marshalling*  
*Prior To Race Start*  
*Race Start*  
*During the Race*  
*Race Finish*  
*DNF & DQF*  
*Judging*
- 6. Safety & Compliance**  
*Regulatory/CASA & MAAA compliance*  
*Safety Issues*

*Fire Hazards*

## 1: Terminology & Definitions

AUW - All up weight or total flying weight including props, battery and cameras.  
FPV - First Person View, a method of viewing the on-board video from the aircraft.  
VTX - Video Transmitter, used to transmit video back to the pilot.  
Lipo - Lithium Polymer Battery Pack

FD - Flight Director  
PM - Pit Marshall  
TM – Track Marshall  
TSO - Track Safety Officer  
SP - Spotter  
RO - Race Official

DNF - “Did Not Finish” no points scored  
DQF - “Disqualified” disqualified from Race/Heat”  
Go Around - A pilot has missed a gate/flag/turn and must go around and re-take it.

ACMA - Australian Communications & Media Authority  
CASA - Civil Aviation Safety Authority  
MAAA - Model Aeronautical Association of Australia

Composite - A mix of multiple materials usually plastic and or/glass/fibre.  
Failsafe - A method of shutdown should the aircraft lose radio signal.  
Transponder - A small device that transmits a unique ID to the timing system fitted to the aircraft.

## 2: Racing Class

AFPVRA normally runs 3 separate classes of racing.  
For the 2017 Australian Drone Nationals we will only be running one class. Open Class.

Open class aligns with the similar class used in National and International FPV racing competition. This class is not locked and subject to change.

**Open Class** – *More open spec, for intermediate and advanced pilots, much faster speeds.*

## Basic Racing Class Rules

(During scrutineering, the following class restrictions will be checked for compliance. If your aircraft does not meet the basic standards for safety and class restrictions you will not be able to race)

The following specifications apply to ALL racing classes and aircraft being operated during the race meet or event.

1. All aircraft must be presented at a predetermined time for scrutineering by race officials. Aircraft must comply with all safety, regulatory and race regulations before being allowed to fly.
2. Backup aircraft are allowed for use but also must be scrutineered inspected prior to use.
3. All frames must be of solid construction and all components must be securely attached. (Suitability for racing will be done during scrutineering)
4. All wiring must be contained and free from interference with propellers.
5. No steel or full carbon fibre propellers allowed, composite or ABS plastic props only.
6. Radio/Flight controller Failsafe must be set and demonstrated to race officials during scrutineering. When triggered the failsafe MUST be set to stop the propellers from spinning.
7. All batteries must be securely attached to the aircraft and deemed safe for use. If a race official deems a particular pack damaged or unsuitable for racing then the pilot must switch batteries before continuing.
8. Propellers must be in good condition and deemed safe for use. If a propeller is overly marked or damaged and deemed unsafe for use by a race official, the pilot must then change that propeller before continuing.

## Open Class Definition

**Max Frame Size:** 330mm motor to motor.

**Max Battery Size:** 5S or 18.5-volt nominal pack voltage.

**Max Prop Size:** up to 6 inch **Max AUW:** 1kg

Additional Restrictions: None

## 3: Aircraft Scrutineering

Competitors must submit all aircraft being operated for scrutineering and inspection before commencing flying. During the inspection a number of items will be checked to ensure the aircraft is safe, compliant and legal to fly.

A competitor that uses more than one aircraft including backup aircraft must ensure all are inspected and logged by race officials before racing commences. Each competitor must ensure that their aircraft complies with all necessary rules and regulations and will pass the scrutineering inspection.

If a competitor's aircraft fails the scrutineering inspection, they will be given the opportunity to correct any defects and resubmit it for inspection prior to flight operations commencing (if time permits).

If any changes are made to the aircraft, it must be resubmitted for inspection. Any competitor may be asked to re-submit his aircraft for scrutineering at any time during the event.

## **Overall/Safety Inspection**

The following items will be checked during the inspection:

- Airframe is of solid construction and no items are loose or in danger of becoming separated from the aircraft during flight and cause a risk or injury.
- All wiring is contained and not loose or at risk of becoming loose during flight and becoming entangled in the propellers.
- All wiring and connectors are of sufficient construction.
- Failsafe on both radio and flight controller is working (set to disarm within 3 seconds of losing radio signal)

## **ACMA Compliance**

- Maximum allowed 25 milliwatts (mw) Video transmitter

## **Class Compliance**

Aircraft adheres to all class restrictions specified in these racing rules for which it was entered. If an aircraft is to be used in multiple classes then it must comply with all classes restrictions for all classes it's entered in.

## **Additional Racing Compliance**

No other additional compliance unless otherwise notified.



## 4: Flight Operations

During an event that includes flight operations all pilots **MUST** adhere to the following flight operations rules. Failure to do so may result in the pilot being disqualified from flying/racing further during the event.

### ***Flight Director (FD)***

The Flight Director (FD) is responsible for all flight operations during the event and is responsible for overall safety of the event.

The Flight Director must give a safety briefing to the pilots prior to the start of flight operations.

Pilots must follow any and all directions made by the Flight Director immediately without question.

At any time, the FD may call a temporary or permanent halt to flight operations for safety reasons.

In the event of the following direction from the FD you must:

**LAND IMMEDIATELY (RACE STOP)** - You must land immediately wherever you are on the course and disarm. Your props should not continue to spin. You are not permitted to continue flying back to the start line, takeoff/landing area. You must not take off again until directed by only the FD. The FD will determine if the race is to be re-run or scored according to position.

**SLOW DOWN/HAZARD** – It means there is some kind of hazard or safety issue and this means you must slow down to a speed that you can land safely if asked to do so by the FD.

**RACE ABORT/RETURN TO THE START** – You must return immediately to the start line or takeoff/landing area responsibly.

### ***Pit Marshall (PM)***

The Pit Marshall (PM) is responsible for safety in the pit area and takeoff/landing areas and must follow any directions made by the Flight Director (FD). The PM is also responsible for ensuring that pilots are ready to race for each of their heats and assembling them prior to racing.

Pilots must present themselves to the Pit Marshall prior to the start of their heat to receive their timing transponder and any directions prior to their race.

# Australian FPV Racing Association

Pilots must follow all directions given by the PM during the event to ensure a smooth race meeting occurs and no delays are encountered getting each heat ready to race.

## **Track Marshall (TM)**

During flight operations **Track Marshalls (TMs)** are positioned around the perimeter of the track to keep an eye on racing and any potential safety issues such as people on the track or other potential hazards.

TMs must be wearing a high visibility to ensure all pilots can easily identify them on the track during flight operations and avoid them.

TMs at any time may call out potential hazards to the pilots and Flight Director (FD). TMs will not at any time give direction to the pilots to change their normal flight operations or flying line. It is the responsibility of the Flight Director ONLY to give direction to the pilots to land immediately or any other change in normal flight operations. This is done to ensure safety and no confusion is made during the race by instructions given by more than 1 person at a time.

The flight director will repeat any potential hazard called out by the TMs to the pilots in case the pilots do not hear the TMs directly.

## **Potential Calls:**

**PERSON ON THE FIELD** – This is serious, pilots must land immediately.

**GATE OR FLAG DOWN** – In the event of a flag or gate going down you are permitted to go over or around the object.

**HAZARD OR SAFETY ISSUE** – In the event there is a major safety issue that a TM identified they are to let the FD know immediately and do anything they can within reason and safely to mitigate the risk after being instructed by the FD to do so. The FD will then decide to continue the race or abort it.

## **Race Officials**

The following persons may be considered a race official and pilots must follow all directions by all race officials.

Flight Director (FD)

Pit Marshall (PM)

Assistant Flight Director & Pit Marshall

Track Marshalls (TM)

Scrutineering Officers

Safety Officer

## **Track Setup**

The track setup will be conducted by nominated officials and must pass all safety and flight operations conditions. The final say on the course is made by the Flight Director only on advice from the Pit Marshall and Safety Officer.

## **The Track Safety Officer (TSO)**

A TSO will be nominated prior to the event or on the day of the event and is responsible for consulting on the safety aspect of the event. The TSO reports to the Flight Director during the course of the event. The TSO cannot be the Flight Director but can be any other race official.

The track must be setup in accordance with CASA and MAAA guidelines and consider all aspects of safety compliance and free of potential hazards. It is advisable that a course safety assessment be conducted prior to the event and identify any potential hazards prior to the event and mitigate them as much as possible.

## **Spotter (SP)**

Each pilot is required to have a spotter that is beside/behind him/her and **MUST** warn the pilot of safety issues. The spotter is not considered to be a race official. A pilot may choose his or her own spotter.

## **Practice (At the event)**

The race program at the event will give every group of 4 pilots a 20-minute session for practice on the track in their qualifying heat group. During practice all pilots must adhere to racing rules including fair play and safety. No one must operate an aircraft prior to practice being approved by the flight director and only once the course is deemed safe and open for use.

## **Video Frequency Use**

According to ACMA regulations and Australian common law we are only allowed to use video transmitters that transmit on the 5.8Ghz band between frequencies 5725 Mhz and 5875 Mhz at no more than 25 milliwatt (mw) transmitted power.

We use 4 channels/frequencies with four pilots at any one time.

We commonly use the following channels/frequencies when racing and you are expected to use one of the 4 channels listed below:

Channel 1 - 5740 Mhz **BLUE**

Channel 3 - 5780 Mhz **YELLOW**

Channel 5 - 5820 Mhz **RED**

Channel 7 - 5860 Mhz **GREEN**

### **VTX Testing & Channel/Frequency Changing**

It is expected pilots will need to change the channels on their video transmitters (VTX's) at least once during the event. Pilots are expected to set their channels prior to arriving for their first heat if channel allocations have taken place prior to the day.

#### **PLEASE NOTE**

Changing channels and testing has the potential to cause crashes during flight operations and you **MUST** adhere to the following:

**NO PILOT SHOULD EVER POWER ON A VTX  
WHILE FLIGHT OPERATIONS ARE  
UNDERWAY!!!!**

There will be nominated times between flight operations (heats) that you can test your VTX or change channels. Under no circumstances should you power on your VTX while others are flying.

**Continual abuse of this rule (more than once) will result in you being disqualified from the event.**

## **5: Racing Rules**

These rules are in effect during all racing events, including practice, qualifying, elimination heats, semi-finals and finals.

### **Definitions:**

PM Pit Marshall

FD Flight Director

TM Track Marshall

SP Spotter

RO Race Official

TSO Track Safety Officer

## ***Marshalling***

- Pilots must report to the Pit Marshall (PM) at least 10 minutes prior to the start of their race to receive their timing transponder and video channel allocation if not already known. (Failure to do so by the time the PM calls the heat ready you will then be disqualified from the race and a DNF result recorded.)
- Pilots must follow all directions made by the PM during the event to ensure the event is run in a timely manner.

## ***Prior To Race Start***

- Pilots must attach their timing transponder to their aircraft and confirm its operation by observing a red flashing LED when power is applied (if required).
- Pilots must change their video frequency to the one allocated (if different) only in between heats and not during flight operations and ensure their video feed is working and they are ready to race.
- Once the PM has declared the race and pilots are ready to race, the pilot must then take the aircraft to the start line and power on the aircraft. (If required the pilot must also confirm with the FD that the timing transponder is working and their transponder ID is set in the timing system).
- The Pilot must then place their aircraft on the start line/takeoff area and confirm it is ready to race before returning to the pilot's area with the PM and prepare to start the race.
- The Pit Marshall will then confirm with each pilot that they are ready to race.

## ***Race Start***

- The Flight Director will confirm with race officials that the course is clear and that the race is ready to start and that the pilots are all ready before commencing the race start procedure.
- Flight Director (FD) will also visually confirm the course is clear and ready.
- The race start procedure will be defined as follows:
  1. FD will call "Race Starting" and activate the start procedure and timing system.
  2. FD will call "Arm your aircraft" and wait **5 seconds**.
  3. FD will call "Racing in 5" and countdown the **5 seconds**.
  4. FD will call "GO" followed by giving the green light if available.
  5. Race is considered started at this point and timing will commence.
- If more than 2 pilots crash on the start line during the actual race start the Flight Director has the discretion to call a race abort and restart the race. If a competitor can immediately restart or can change a broken propeller prior to the race restart they may do so.

## ***During The Race***

- If at any time the Flight Director calls a halt to the race pilots must follow the instructions given. If the FD calls for the pilots to land immediately due to safety concerns they must do so immediately.
- All pilots must follow the direction of the course and follow any course line set out by track markers, flags and or gates.
- In the event a gate or corner flag is missed by the pilot, the pilot is to go around again and re-take the missed gate or flag. If the pilot does not follow this instruction they will be disqualified from the race and a DNF result will be recorded.
- In the event a pilot intentionally crashes into or causes another pilot to crash then that pilot will be disqualified from the race and a DNF result recorded.
- If the Flight Director deems any pilot to be competing in a manner that is deemed unfair or unsportsmanlike then the FD has the discretion to disqualify

# Australian FPV Racing Association

a pilot from a particular race, or the entire event. In this case a DNF result is recorded.

- If the Flight Director deems a pilot is in breach of any of the race rules or regulations or their aircraft is in breach of class or safety restrictions, then the FD can ask for the pilot to present the aircraft for scrutineering inspection at any time during the event.
- If a pilot crashes during a race but can re-start the race they may do so providing the aircraft is airworthy and still able to fly. If a race official turns the aircraft right side up or resets it in any way after the crash the pilot is able to restart the race with this assistance providing the aircraft is airworthy and still able to fly.
- At no time will a pilot enter the track/course to retrieve their aircraft during a race or flight operations. Only a race official may do so at the direction of the FD.
- Pilots must complete all laps set as part of the race parameters. Failure to do so is considered a DNF.

# Australian FPV Racing Association

## ***Race Finish***

Once the race has finished and all pilots have completed all their laps the race is considered finished.

Pilots must all return to the start/finish line or landing area and disarm their aircraft. The Flight Director must officially call the race completed and course is clear before anyone including pilots can enter the course to retrieve aircraft and make any track repairs or modifications.

The Pit Marshall must walk out with the pilots to the aircraft and ensure all aircraft and any parts if any have broken off the aircraft are retrieved from the course. The PM must also coordinate with the TM's and race officials to make any repairs to the track or modifications as directed by the FD.

If required the Pit Marshall must also retrieve the timing transponders from all pilots before they are allowed to return to the pit area. It is also the responsibility of all pilots to ensure these transponders are returned immediately after the race has finished.

In the event that a transponder is damaged during racing the pilot should inform the Pit Marshall immediately.

## ***Did Not Finish (DNF) & Disqualification (DQF)***

- In the event a pilot crashes out of a race then they are considered as “Did Not Finish” or “DNF”.
- In the event a pilot is DNF for a race then no points for that particular race will be awarded.
- If the race is an elimination heat, then a DNF will result in the pilot being eliminated from the competition.
- In the event a pilot or a pilot's aircraft is “ Disqualified” or “(DQF)” for any reason then that pilot or aircraft will not be permitted to participate in the event further and must not fly.
- Only the Flight Director may disqualify a pilot or aircraft from an event.

## ***Judging***

At any particular racing event, the race organisers may appoint racing judges to watch pilot FPV feeds during the race to ensure all race rules and course direction is complied with by competitors.

The judge will be watching a single pilots FPV feed either by using goggles or an external screen to determine the pilot is following all racing rules and is following the course correctly. If a judge deems that a pilot must perform a “Go Around” or “Retake” of a corner or gate then the pilot must comply with instructions or face being disqualified.

The Flight Director can overrule a judge’s decision and ultimately the FD decision is final.

## **6: Safety & Compliance**

### ***CASA and MAAA compliance***

All competitors must ensure that they follow all directions by race officials when it comes to Safety and Compliance.

All competitors must ensure that they comply with any local, state and federal regulations/bi-laws/laws as defined by said regulatory bodies such as local council, CASA and ACMA.

All competitors must ensure that they follow all MAAA MOP's (Manual Of Procedures) when flying.

Failure to do so will result in you being asked to land and possibly disqualified from competing further at the event.

For a full list of CASA , ACMA regulations, and the Model Aeronautical Association Australia's Manual Of Procedures please see their respective websites or contact the organisation directly for more information.

CASA - <https://www.casa.gov.au/>

ACMA - <http://www.acma.gov.au/>

MAAA - <http://www.maaa.asn.au/documents-manual-of-procedures/>

### ***Safety Issues***

Safety is the Australian FPV Racing Association's primary concern. It is every competitor's responsibility to ensure they operate themselves and their aircraft in a safe and professional manner.

A pilot's safety briefing will be performed prior to flight operations commencing, this is usually given by the Flight Director and includes the course layout, any safety issues or hazards to be aware of and any emergency situations that might occur.

All spectators and visitors must be aware of the potential safety hazards and it's everyone's responsibility to ensure everyone is safe during the event.

### ***Fire Hazards***

Lipo batteries are potential fire hazards when punctured or incorrectly charged.

# Australian FPV Racing Association

Disclaimer: Please refer to your battery and charger manufacturer for instructions and recommendations to properly charge, discharge or storage charge your LiPo batteries.

Safety Concerns: Please take extra precautions to store your batteries in a proper storage state chemically, at room temperature and in a LiPo storage bag. Never discharge or charge your batteries unattended. If you have a LiPo battery that's damaged in any way, physically or puffed (outgassing), dispose of it properly right away.

LiPo batteries may only be charged within a designated charging area.

It is essential that everyone is aware of the locations of any extinguishers and sand buckets located around the course and their use in the event of a fire.

**In the event of their being a total fire ban at the location of the event then the event will be postponed or cancelled. There will be NO flight operations during total fire ban days.**

Australian FPV Racing Association's fundamental values are;

**1. Safety 2. Fun 3. Comradery**

Good luck!

If you have any questions please email: [info@afpvra.org](mailto:info@afpvra.org)