British Drone Racing Association

BDRA Rules 2022

Authored and maintained by BDRA Race Rules and Technical Standards sub-committee

Version Control

Date	Purpose
January 24 2016	Initial draft and consultation phase
January 01 2016	Amendments incorporated and ratified by BDRA committee
January 11 2018	Pre-release / updated and split into 3 volumes
February 4 2018	Amendments incorporated and ratified by BDRA committee
October 31 2018	Amalgamated back into 1 document, amendments incorporated and ratified by BDRA committee
February 4 2019	Amendments regarding regional system incorporated and ratified by BDRA committee
January 31 2022	Amendments made by BDRA committee based on feedback from the membership over the 2021 season and recent questionnaire responses. For review and discussion with members at EGM on Wednesday 23rd February.

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Contents

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Glossary of Terms

Competition Organiser: Role with overall responsibility for arranging and publicising an event to the racing community, and appointing the Race Director and other Race Officials to assist in the smooth running of the competition.

Race Director: Role with overall responsibility for managing the competition on race day. Specifically, the Race Director is responsible for the maintenance of the track, safety, spotters, flight line, adjudication, penalty procedures and delivers the safety briefing.

Race meeting: A collection of races that are usually split into a qualifying phase and a finals phase.

Practice: The period before qualifying during which competitors get to familiarise themselves with the track and to prepare their models for racing.

Heat: An individual race with between 4 and 8 competitors.

Qualifying round: A set of 'heats' which includes all of the competitors. At the end of the first qualifying round each competitor will have raced once. Each competitor accrues points across the qualifying rounds to determine their position in the finals. All competitions have multiple qualifying rounds to ensure each competitor has a fair opportunity to qualify.

Finals: A set of races in which competitors get to compete for podium positions. Competitors are organised by qualifying position and depending on the competition format, may have been reduced in number by one or more optional elimination rounds.

British Championship: The official BDRA end-of-season competition where the British Champion is crowned.

British Championship Series: The sanctioned National and Regional Series that consist of Qualifying Events run to BDRA rules that enable qualification to the British Championships.

Qualifying Event: A BDRA sanctioned race meeting where a competitor can accrue points towards entry into the British Championship.

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1. General Event Rules

1.1 Membership: To be eligible to have results count towards qualification of the British Championships, the competitor must be a fully paid-up member of the BDRA, by 12:00 noon on the day of any qualifying competition that they compete in.

1.1.1 Membership is £10 per year, available from 1st January each year and valid from 1st January until 31st December annually.

1.2 Race Entry: Entry fees must be paid in full by the entry deadline. Entry to the event is not guaranteed until all fees have been received.

1.3 Cancellations: Cancellations must be received by the cancellation deadline.

1.3.1 Fees and deposits may be returned at the discretion of the Competition Organiser, less any cancellation fees.

1.4 Arrival/registration: Competitors will be required to check-in with the Race Director (or designated check-in official) upon arrival.

1.5 Failsafe checking: Competitors will be required to demonstrate a fully functioning failsafe (motors cut on loss of signal) before they are permitted to access the track. All drones to be used at the event must be failsafe checked.

1.6 Insurance: Competitors will be required to provide evidence of current insurance, appropriate for the venue.

1.6.1 Drone registration check: All drones must comply with current CAA drone regulations.

1.7 Safety: Competitors will be required to attend the safety briefing, the time of which will be advertised pre-event.

1.7.1 The Race Director may hold a second briefing for latecomers at their discretion. Access to fly the track will not be permitted until the competitor has attended the safety briefing.

1.7.2 All drones are grounded for the duration of the event unless flying in the current heat. Hover / VTx testing can only be performed with the permission of the race director in the assigned area.

1.7.3 Powering on in the pits for testing or repair will only happen with VTx off AND props off.

1.7.4 A 2m exclusion zone will be present around the start line. Drones should be placed in the appropriate position on the start line and powered on, however it is forbidden to arm until all pilots have exited the exclusion zone.

1.7.5 At the end of the race pilots land in the designated landing area immediately and wait for the permission of the race director to enter the track area to retrieve drones.

1.7.6 When retrieving drones they must be powered off completely and carried off the track, do not attempt to re-arm during this time.

1.7.7 In the event of fire during a race the Race Director will issue the command to land, all pilots must land immediately only then can the track be accessed to deal with the incident. Do not attempt to re-arm your drone during this time.

1.7.8 In the event of a flight controller malfunction (e.g yaw spin), disarm immediately and let your drone drop. Do not try to regain control in this situation.

1.7.9 Test flights may be granted only by the race director in a designated area.

1.8 Track status: The track will be open for inspection and 'track walking' before the first round of races commences.

1.8.1 The track will be considered 'live' once the first round commences until the day's racing is over.

1.8.2 Access to the 'live' track can only be granted by the Race Director and Track Marshals, who will manage the competitors entering and exiting the track before and after each race.

1.8.3 Access to the track whilst there are models in the air is strictly forbidden.

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1.9 Flight line: Competitors may only fly during their race and only from the designated pilot area.

1.9.1 Competitors that are not in the race must not interfere with the progress of any pilot in the race.

1.9.2 Competitors must only enter the designated pilot area as directed by the Race Director or dedicated Race Officials.

1.10 Spotter: Typically a competitor will be required to spot for the race before their own. Any alternatives to this will be announced during the safety briefing.

1.10.1 Failure to spot (or provide a suitable substitute) as required will result in forfeit of the previous round's forfeit your current best rounds score. This is at the discretion of the Race Director.

1.10.3 Coach: A coach is permitted in addition to the assigned spotter. The coach will not interfere with any pilot

1.10.4 The role of the spotter: A spotter is to observe and count laps. it is NOT the responsibility of the spotter to advise the pilot as to track direction or any missed obstacles.

2. Qualifying for the British Championships

2.1 Qualifying Positions: The current format is structured for a maximum of 60 qualifying positions for the British championship; a maximum of the next 10 pilots will make the reserve list.

2.2 British Championship Series: The sanctioned national series that consists of Qualifying events run to BDRA rules, which enable qualification to the British Championships:

2.3 National Series Format: National Series will consist of at least FIVE British Championship Qualifying competitions.

2.3.1 A member's best five results will count towards their overall National Series position.

2.3.2 Attendance at only ONE event is required to be eligible to qualify for the British Championship.

2.4 Qualifying Event Format: The Qualifying Events that make up the National Series will consist of at least FIVE rounds in the qualifying phase. Where a competition is abandoned, there must be at least THREE rounds completed for the result to count towards qualification for the British Championship.

2.4.1 The overall results from the finals will count towards the series point allocation. Should the finals have to be abandoned due to unforeseen circumstances at least 50% of a competitor's best qualifying rounds will be used as a basis for the points allocation.

2.4.2 The BDRA Committee may sanction alterations to the Qualifying Event format, where this is the case, the race organiser must communicate any changes to all competing members prior to commencement of the event. Smaller alterations will be sanctioned on the day by the BDRA Committee before racing commences.

2.4.3 Further details of Race Format options and technical specifications can be found in the Technical Rules and Organisers section.

2.5 Scoring System: The points allocated to a pilot depend on the placing of that pilot. The points allocated to pilots will depend on the number (n) of pilots who have flown the event. Points are allocated as follows.

Placing	1	2	3	4	5	6	...	n-1	n
Points	n	n-1	n-2	n-3	n-4	n-5		2	1

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3. Pilot Conduct

3.1 Pilot Conduct: As a new and growing sport, Drone Racing has a wonderful community of passionate pilots and supporters. It is the excitement of the experience that attracts people to the sport, but still to be a supportive community that encourages new members to stay.
3.1.1 All pilots will follow the instructions of the Race Director for both safety and the effective running of the event.

3.2 Event Conduct: The BDRA has a zero-tolerance policy to any violent, threatening, harassing, aggressive or bullying behaviour at events. Such behaviour will result in being asked to leave the event. If someone not competing at the event behaves in such a manner, they will also be asked to leave. Please note if such person(s) are associated with a specific pilot then that competitor may also be asked to leave the event. Temporary or permanent banning of offending parties may also be imposed.
3.2.1 Online Conduct: The BDRA is similarly opposed to any online conduct that can be considered bullying, harassing or victimising. Members that feel they are being subjected to such behaviour online are asked to report it to a member of the BDRA with evidence. It will be dealt with through mediation or in extreme, by temporary or permanent banning of the offending party.

3.3 Discrimination and Harassment: In line with the Equality Act 2010, no member of the BDRA will be discriminated against on the grounds of a protected characteristic; age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation. Any discrimination on the grounds of being targeted against these protected characteristics is deemed as harassment. If any member is being subjected to harassment, they must report it to a member of the BDRA committee with any available evidence. It will be dealt with through either mediation or in extremis, temporary or permanent banning of the offending party.

3.4 Illegal substance abuse: In line with the Psychoactive Substance Act 2016, BDRA members are asked not to bring any illegal substances to any BDRA sanctioned event. If a member or individual at an event is suspected of being in possession of illegal substances will be asked to leave.

3.5 Sportsmanship clause: All pilots are expected to demonstrate sportsmanlike conduct at all times during an event.

4. Organisers Rules

4.1 The Qualifying Event Calendar: The official BDRA season will run from one month after the British Championship to up to 4 weeks before the next British Championship. Qualifying Events will be scheduled with the aim of maximising the number of opportunities for members to take part in as many Qualifying Events as possible. The diary will be managed to avoid competition clashes , and two qualifying competitions on the same day would only be sanctioned where there is sufficient distance between them.

4.2 Bidding for a National Series Event: Organisers wishing to hold a National Series Qualifying Event are requested to contact the BDRA Committee, stating the proposed date of the event.
4.2.1 If more than one organiser bids for the same National Series Qualifying Event, the BDRA Committee will take into account the scale of the event, the track record of the organiser and location of the competition (with preference being to widely distributed national events).

4.3 National Series competition entry requirements: Qualifying Events must be open to all BDRA members and advertised widely at least ONE month prior to the event.
4.3.1 Qualifying Events will have a minimum of 30 competitors and a minimum of 5 qualifying heats.
4.3.2 It is mandatory for all entry fees for qualifying Events to be offered at least £2 less for BDRA members over non-members.
4.3.4 Organisers should inform participants that in order for their results to count towards British Championship Qualifying, they must be BDRA members before signing up for the event.

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5. Track Specification

5.1 Track area: The track area consists of the track plus any safety features that separate it from spectators, competitors or race officials.

5.1.1 The track area is the only area within which models may be flown and must be clearly defined to prevent unauthorised access.

5.1.2 Suitable precautions must be taken to ensure models do not fly into spectators, competitors or race officials should they leave the track area.

5.1.3 Any netting should be of suitable height and strength to contain the models and where there is a risk of a model sliding under the netting then it should also be tethered at its base.

5.1.4 Any part of the track that is not protected by netting must be segregated from the flight line by a minimum safe distance of 30m.

5.1.5 There must be a clear, unobstructed view of the track area from Race Control in order that the Race Director can be confident of maintaining safety at all times.

5.1.6 Adjacent sections of the circuit where models may be travelling in opposite directions will be separated by an appropriate safe distance to reduce the risk of a mid-air collision.

5.1.7 Turns will be marked by a clearly visible turn flag or air gate.

5.1.8 Sharp or high speed turns must be directed away from the competitor or spectator areas.

5.1.9 The circuit will consist of at least 6 air gates, 6 turn markers and may optionally include special obstacles to be crossed or avoided.

5.1.10 A special obstacle may replace a standard air gate if it presents a similar challenge to the competitor.

5.3 Standard air gates: Air gates must have an opening that is at least 1.2m wide and 1.2m tall.

5.3.1 Larger airgates may be used when running competitions with larger heat sizes.

5.3.2 Air gates placed in a direct line adjacent to one another count as one.

5.3.3 Air gates must contrast with the background and be visible with standard FPV video equipment at a distance of 30m.

5.4 Standard turn markers: Turn flags and pylons must be at least 2.4m tall. Pilots must not fly above the height of the flag whilst navigating it.

5.4.1 Turn markers must contrast with the background and be visible with standard FPV video equipment at a distance of 30m.

5.6 Track markers: The circuit must be marked out along its length using track markers in a single row which follows the racing line racing line. 20cm diameter sports cones / markers are usually used.

5.6.1 Track markers must contrast with the background and be capable of clearly defining the track with standard FPV video equipment for a distance of 30m. White cones work best on green grass.

5.7 Start grid: The start grid will be placed on or off the racing line, perpendicular or parallel to the racing line depending on the start grid system in use, at a point with easy access from the flight line.

5.7.1 Where the start grid is placed off the racing circuit the section between the grid and the circuit will be considered part of the race distance / time.

5.7.2 Optionally the start grid may be spaced according to the qualifying position of pilots so as to advantage those qualifying in a better position.

5.7.3 The start grid must be as a minimum 10m from the first obstacle.

5.8 Landing zone: A landing zone should be designated to provide a safe area within which competitors who have completed their race can land without fear of obstructing competitors who are still racing and without causing video interference.

5.9 Pilot spacing: For outdoor racing the track should be situated at least 30m from the flight line to help prevent video issues.

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6. Competition Procedures

6.1 Heat size: Heats will consist of between 4-8 competitors

6.1.1 Heat size will remain the same during the qualifying rounds.

6.2 Qualifying format: Competitions will have a minimum of five qualifying rounds.

6.2.1 50% of the qualifying rounds rounded up will be used to seed pilots for the finals. For instance where there are nine qualifying rounds, 5 would be used, and a competitor's best five results will seed their position in the finals.

Number of rounds completed	Number of rounds to count for seeding finals
3	2
4	2
5	3
6	3
7	4
8	4
9	5
10	5
11	6
12	6
13	7
14	7

6.2.2 To maximise throughput and simplicity, competitors remain in the same heat throughout the qualifying stage.

6.3 Frequency scheme and management: The video frequency scheme will consist of an appropriate number of channels within the 5.8 GHz band with a minimum 35 MHz separation, in order to accommodate the target number of pilots per heat for the event.

6.3.1 The frequency scheme will be selected by the Race Director and announced prior to the event.

6.3.2 All competitors will be required to support ALL frequencies for the competition and will be expected to be able to switch to any alternative frequency with reasonable notice in order to facilitate a fair racing format.

6.3.3 A digital video recorder (DVR) is strongly recommended in order to review races as necessary in case of doubt or complaint.

6.3.4 The competition organiser will aim to check the venue for video quality and announce any restrictions prior to the event.

6.3.5 The Competition organiser may additionally recommend a combination of equipment (e.g.: video receivers, polarised / directional antennas) to further optimise the quality of the video signal.

6.3.6 It is the responsibility of each competitor to ensure that they can set their allocated frequency.

6.3.7 Competitors may be expected to submit to a random video transmitter inspection by the Race Director upon request.

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6.4 Frequency discipline: Video transmitters may only be powered on whilst the competitor is racing or at the trackside and readying their equipment for their next race.

6.4.1 Video transmitters are to remain OFF at all other times, unless an exception is made by the Race Director.

6.4.2 No other 5.8GHz transmission OF ANY KIND will be permitted anywhere on site for the duration of the event.

6.4.3 Competitors found contravening this rule will be disqualified from the competition.

6.4.4 All long range UHF control equipment such as but not limited to TBS Crossfire should be switched off in the pits to avoid congesting sometimes limited bandwidth.

6.5 Penalties: Adjustments for penalties will be announced prior to the competition and will include (but not limited to) jump starts and missed gates / obstacles.

6.5.1 The pilot is responsible for setting off at the start of the race and completing all obstacles correctly.

6.5.2 In the event of a jump start: return to the start area and wait for the race to start.

6.5.3 In the event of a missed gate / obstacle : return and complete the missed gate / obstacle.

6.5.4 Failure to adhere to any of the above points (6.5.1-6.5.3) will result in the lap being invalid.

6.5.2 Two attempts clause: Should a pilot be unable to complete an obstacle having attempted it twice they may skip that obstacle and move to the next one.

6.6 Optional race rules: All optional race variants will be announced prior to the competition.

6.7 Flight occurrences: If an obstacle is damaged or destroyed during the race: When an obstacle is accidentally damaged or destroyed during a race, the pilots will be informed as soon as possible of the incident and how to proceed, by the Race Director.

7. Qualifying Procedure

7.1 Qualifying format: Qualifying will be scored using combined laps and time of your best rounds.

7.2 Qualifying race duration: Heats will be 2 minutes duration followed by an extension to complete the current lap of 30 seconds.

7.3 Lap Cap: Race organisers may decide to implement a lap cap to make racing closer or to avoid battery damage on faster less technical tracks.

7.3.1 The lap cap will be decided after the 1st round of qualifying, it is at the race directors discretion.

7.3.2 Any laps above the lap cap from the first round of qualifying will need to be removed before starting the next round.

7.3.3 The timing system needs to be set to call out when a pilot has reached the lap cap, the pilot should then immediately proceed to the landing area whilst not interfering with the racing line and land their drone. Pilots who have completed their laps are not permitted to continue flying.

7.4 Race start: The race should be started with 3 tones 1 second apart to allow the pilots to get ready to start the race followed by a start signal of a different distinct tone at a random interval between 1-3 seconds after the 3rd tone.

7.5 Mass start: Will use a linear start grid long enough to maintain a minimum separation of 0.4m between models.

7.5.1 Models must start entirely from within the start grid.

7.5.2 The race timer for all competitors will start at the start signal, not when the start gate is passed.

7.6 Seeding: Seeding of qualifying rounds can be done using the following methods

7.6.1 The national rankings table used to group competitors by similar ability.

7.6.2 ELO table (supplied by iFPV) used to group competitors by similar ability.

7.6.2 Random pilot seeding decided from within the timing software.

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7.7 Tie-breaks: In the event of a tie-break score, the competitor with the BEST round score will be awarded the position, using all counted rounds until the tie is broken. If they are still tied after all rounds are taken into account then the competitor with the fastest time will be awarded the position.

7.8 Adjustments: If race timings have to be adjusted following a race to take into account penalties then the qualifying positions will be recalculated from the adjusted times.

7.9 Restarts: In qualifying no restarts will usually be offered. In the event of fire ALL pilots are to land immediately and the incident will be dealt with. The round will then restart.

7.10 Video issues: If a pilot has a video issue during a race this must be brought up with the Race Director who upon DVR review will validate the situation and at their discretion may grant a rerun of that round for the affected pilot/pilots.

8. Finals Procedure

Finals are an essential part of Qualifying Events; points for British Championship Qualification will be accrued based on final position. Finals also allow a race organiser the ability to award prizes for podium positions etc.

8.1 Finals format: Finals format for the all British Championship Competitions will be determined before registration for the event begins and will be one of the 2 following formats.
9.1.1 Triple finals for all
9.1.2 Double elimination finals

8.2 Finals race duration: Duration will be consistent with qualifying round race duration.

8.3 Finals race distance: Race distance will be consistent with qualifying round race distance.

8.4 Final race start: Triple finals for all: mass start can be used and populated based on qualification position. Double elimination: Mass starts only. Linear start grid.

8.5 Final scoring for triple finals: The winner of each race in the finals will be the competitor who completes the race distance in the shortest time.
8.5.1 position points: in triple finals for all points for finishing position in each of the 3 races are used to determine the final position. For 6 pilots 1st 10 points, 2nd 7 points, 3rd 5 points, 4th 3 points, 5th 1 point and 6th 0 points. If no competitors complete the race distance then the competitor who completes the most laps will be awarded the win.
8.5.2 In the event of a tie, the time taken to complete those laps will be used to decide the winner.

8.6 Final adjustments: If race timings have to be adjusted following a Grand Final to take into account penalties then the winner (and podium positions) will be recalculated from the adjusted times.
8.6.1 No announcement of the winners will be made until the adjustments have been accommodated.

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9. Penalties

9.1 Penalty system: Penalty system used will be at the discretion of Race Director

Penalties available to the Race Director are as follows:

- Verbal warning
- Loss of a round
- Time penalty
- Lap penalty
- Disqualification

9.1.1 The penalty for not flying the track as designed is the loss of the lap wherein the contravention occurred.

10. Protests/Appeals

11.1 Protest and appeal procedure: Protest and appeal procedures including restarts for VTX reception issues and mid-air collisions will be at the discretion of the Competition Organiser.
11.1.1 Pilots will need to provide their own DVR as evidence for a protest or appeal to the race director and then this may be corroborated by the race directors DVR if available.
11.2 Adjudication: The decision of the Race Director following any protest procedure will be final.

11. Interruption Procedures

11.1 Abandonment criteria: In the Competition of an isolated transient incident, any single heat may be abandoned and restarted at the discretion of the Race Director.
11.1.1 In the Competition of a prolonged interruption (e.g. adverse weather conditions) the Race Director may consult with the Competition Organiser and/or offer a vote to all competitors to decide if racing can continue.

11.2 Abandonment procedure: If qualifying has been completed at the point of abandonment then results for the Qualifying Competition will be accepted into the rankings.
11.2.1 Competition rescheduling eligibility: If qualifying has not been completed at the point of abandonment then the Competition Organiser may apply for the whole Competition to be rescheduled at a later date, provided the postponement still meets the criteria for Qualifying Events.

12. Finals Formats

12.1 Triple Finals for All
Objective: Similar to Finals for all but mitigates the effect of a single instance of bad luck.
Limitations: Needs more time to run (can be limited to top tier finals only).
Benefits: For big title/prize Competitions where competition may be fierce, multi-leg finals provide greater emphasis on consistency and can mitigate an isolated incident during a Final.
Implementation: All competitors will be sorted by their qualifying position and put into finals. Each final will consist of the same number of competitors as each preceding Qualifying Heats. Winner of each Final will be the first to complete the race distance or the competitor who completes the most laps in the shortest time.

12.2 Double Elimination Knockout
Objective: Suited to larger competitions
Limitations: Needs more time to run.
Benefits: For big title/prize Competitions where competition may be fierce. Allows all of the qualifying pilots a chance at winning (not just the top 6). Double elimination can mitigate an isolated incident during a race and gives the competitor a second chance.

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Implementation: All competitors will be sorted into heats based on their qualifying positions the heats are mixed skill, in double elimination half the pilots in a race would progress onto the next round in a 'winners bracket' the losers would move to a 'loser bracket' but would given a second chance, another loss sees them eliminated from the competition.

13. Technical Rules

13.1 Aircraft Specifications:
13.1.1 Airframe dimensions: 300mm maximum diameter across motor shaft centres.
13.1.2 Propellers: 6 inches maximum diameter. Metal, wooden or carbon-fibre propellers are not permitted.

13.2 Airframes: 6 motors maximum.

13.3 Batteries: 6S limit (unless restricted by the event organiser for safety or venue reasons).

13.4 Radio equipment: Normally 2.4GHz wideband spread spectrum control; however, any control system that is legal in the UK that doesn't need active frequency management can be used providing it does not cause interference to other competitors.
13.4.1 The competitor is responsible for compliance with regulatory and legal requirements.
13.4.2 All control equipment should be switched off in the pits to avoid congesting sometimes limited bandwidth.

13.5 Video equipment: 5.8GHz single channel video systems may be used providing it does not cause interference to other competitors.
13.5.1 The competitor is responsible for compliance with regulatory and legal requirements.
13.5.2 A pit switch to turn on and off the vtx is strongly advised.

13.6 Video systems: Provided a system can be used on any of the event channels and does not cause interference on other event channels then it may be used.
13.6.1 Allowed video systems:
1. Analogue video systems with an output power of no more than 25mW.
2. HD-Zero video systems with an output power of no more than 25mW.

13.7 Firmware aids: To progress with the technological advancements ,e.g Anti-crash and Self-righting 'Turtle Mode' is permitted.

13.8 Launch aids: Personal launch pads are permitted as long as they don't impede the start of other competitors.

13.9 Electronic timing equipment: The British Championship Series and the Championship Competition itself will be run using the immersionrc LapRf VTX based timing system or similar equipment. The system chosen must offer similar reliability and accuracy to an immersionrc LapRf system.
13.9.1 A race heat normally lasts for 2 minutes with 30 seconds to finish the lap each competitor is on.

13.10 Venue-specific restrictions: A track or venue may require further technical restrictions in order to maintain safety, most notably a reduction in battery cell count, frame or propeller size. The competition organiser must announce these restrictions at least two weeks prior to the event.