



# Royal Aero Club Records, Racing and Rally Association

## General Rules for Air Racing Issue 1.1

Royal Aero Club Records, Racing and Rally Association

35 Rodney Road

Cheltenham

Gloucestershire

GL50 1HX

Errors or amendments to these rules should be notified to [secretary@royalaeroclubrrra.co.uk](mailto:secretary@royalaeroclubrrra.co.uk)

© Royal Aero Club Records, Racing and Rally Association Ltd (T/A British Air Racing) 2020

## Amendment Log

Issue	Description	Date
1.0	First of new format	01/01/21
1.1	Incorporation of committee comments, correction of spelling, grammar and syntax errors	21/02/21

## **CONTENTS**

### **RULES FOR SAFETY**

1. Minimum heights
2. Limitations for courses
3. Weather minima
4. Race practice and scatter practice
5. Pilot requirements
6. Aircraft requirements
7. Drugs and alcohol
8. Operation of aircraft
9. Airside personnel
10. Postponement, abandonment or cancellation

### **ADMINISTRATION AND ORGANISATION**

11. Interpretation
12. Announcements
13. Entry submissions
14. Entry fees
15. Refusal of entries
16. Late entries
17. Limitation of numbers
18. Officials
19. Powers of the officials
20. Registration
21. Attendance at briefings
22. Expenses
23. Supplementary regulations
24. Insurance
25. Postponement and abandonment

### **AIRCRAFT REQUIREMENTS**

26. Identification
27. Minimum speed
28. Throttle & RPM stops
29. Fuel level
30. Configuration changes
31. Legality
32. Overall condition

### **HANDICAPPING & COURSES**

33. Assumptions and conversion factors
34. Formulae
35. Units of measurement
36. Use of historic data
37. Use of weather data
38. Octagons
39. Determination of race speed
40. Determination of acceleration allowance

41. Race start
42. Publication of turn points
43. Timekeeping
44. Delayed starts
45. Discarding of octagon data
46. Field average improvement
47. Valid GPS data
48. Marking of courses

## RACING RULES

49. Carriage of passengers
50. Format
51. Start
52. Speed
53. Turning points
54. Level turns
55. Missed turns
56. Overtaking
57. Race height and finish height
58. Finish

## PENALTIES

59. Over/under weight
60. False declarations
61. False starts
62. Failing to comply with height restrictions
63. Cuts
64. Misses
65. Excess/Inadequate speed
66. Breach of other rules
67. Fines
68. Exclusion
69. Disqualification
70. Suspension

## RESULTS

71. Dead Heats
72. Provisional results
73. Final results
74. Publication of results
75. Suspension of results

## PROTESTS

76. Right to protest
77. Time limit for protest
78. Lodgement of a protest and protest fee
79. Adjudication of protest
80. Malicious or vexatious protests and protests without foundation
81. Re-run

## APPEALS

82. Right to appeal
83. Hearing by RAeC RRRA
84. Jurisdiction of the Royal Aero Club as to appeals
85. Jurisdiction of the F.A.I as to appeals
86. No appeal outside of own country
87. Appeal other than by a holder of an FAI license issued by the RAeC
88. Appeals against international suspension or disqualification
89. Form of national appeal
90. Form of international appeal

#### CHAMPIONSHIPS AND TROPHIES

91. Inclusion in championships
92. The points system
93. The British Air Racing Championship
94. The Total Points Championship
95. The Saturday Challenge
96. The Novice Challenge
97. The Mitel Sword
98. The Homebuilt Challenge
99. The British Air Racing Navigators Championship
100. No competition
101. Trophies not to leave the UK

#### OTHER

102. Conduct of members

## **RULES FOR SAFETY**

### 1. Minimum heights

- 1.1 The minimum height for the race course shall be set such that compliance with ORS4 1174 is achieved between turning point 1 and Point Alpha (the point at which descent to the finish may commence).
- 1.2 The minimum height at all times and phases of the race shall be not be less than 50ft AGL.

### 2. Limitations for courses

- 2.1 The airfield turn and the lateral limit of the finish line shall be sited no less than 150m from any public area on the airfield unless otherwise specified by the CAA.
- 2.2 The first scatter point shall be sited not less than 1km from the start line.
- 2.3 Scatter points shall be sited such that the angle of the turn is not more than 60 degrees unless local geographical constraints require it to be greater in the interests of safety so long as the turn can be executed safely by any aircraft meeting the minimum performance requirements of these rules. The turn angle for right hand scatters is limited to 45 degrees.
- 2.4 The minimum permissible length of take-off run available is 675m.

### 3. Weather minima

- 3.1 The minimum permissible visibility is 5km.
- 3.2 The minimum permissible cloud base is 300 feet above the sum of the highest point on the course and the minimum race height above ground level.
- 3.3 No practice or racing shall take place within 5km of electrically active storm clouds or areas of known extreme turbulence, windshear, downdraughts or microbursts.
- 3.4 No practice or racing shall take place in heavy precipitation or severe icing conditions.

### 4. Race practice and scatter practice

- 4.1 Pilots competing in a race must have completed at least one full practice lap during the race practice period.
- 4.2 Pilots competing in a race must have practiced the scatter in the exact same configuration as it is for the race using the exact same runway in normal take-off conditions.

### 5. Pilot requirements

In the interests of safety, pilots entering a race must;

- 5.1 Have logged a minimum of 100hrs as pilot in command of aeroplanes meeting the requirements of the type or class rating applicable to the aircraft being entered into the race.
- 5.2 Have successfully applied for and been issued an FAI racing licence.
- 5.3 Have successfully completed a check flight with a check pilot approved by the committee.
- 5.4 Have successfully completed a handicapped air race organised by the RAeC RRRRA without exclusion or disqualification for an endorsable offence within the previous 5 years OR have successfully completed at least one handicapped air race organised by the RAeC RRRRA without exclusion or disqualification for an endorsable offence in the company of a supervising navigator appointed by the committee. The committee may exempt named pilots from this requirement in extenuating circumstances.

### 6. Aircraft requirements

- 6.1 Aircraft must be able to take-off at race weight in no more than 650m with an ambient temperature of 30 degrees Celsius.
- 6.2 Aircraft may not carry oxygen or oxygen producing agents such as nitrous oxide. Where aircraft are fitted with oxygen generating equipment or storage which cannot be removed, said equipment should be depleted and disabled for the duration of the race.
- 6.3 Aircraft must have adequate visibility to the front and sides.

## 7. Drugs and alcohol

- 7.1 Competitors must comply with the Air Navigation Order in respect of blood and breath alcohol limits and are reminded that the limits are substantially lower than the requirements of the Road Traffic Act for operation of a motor vehicle. The consumption of alcohol is exempted from the requirements of rule 7.3. Any person who acts or attempts to act as a pilot or passenger during the course of an air racing event whilst, in the opinion of two or more officials, he is clearly under the influence of alcohol will be immediately excluded and disqualified from the event. That person may, at the discretion of the committee be subject to a lifetime ban from the Association and have their FAI licence revoked.
- 7.2 The use of prescription or the over-the-counter medication is permitted in accordance with CAA medical guidelines. Any person who's capacity to operate an aircraft safely is, in the opinion of two or more officials, clearly diminished by such medication will be disqualified and excluded from the event.
- 7.3 The use of unlawful recreational drugs and psychoactive substances by members of the Association is strictly prohibited. Any person found to be in possession of or have consumed such substances at or within 72 hours of an Air Racing event that they are attending or at any time in such a way that could cause reputational damage to the Association will receive a mandatory lifetime ban from RAeC RRRRA organised events and will have their FAI licence revoked. Competitors must also comply with the FAI anti-doping policy.

## 8. Operation of aircraft

The pilot in command of an aircraft is strictly responsible for the safe conduct of the flight. Compliance with the direction of an air traffic controller, AFISO, air/ground radio operator or an RAeC RRRRA official is at the discretion of the pilot in command and does not in anyway transfer the strict liability of the pilot to the RAeC RRRRA. However, if the pilot in command fails to comply with the reasonable direction of an RAeC RRRRA official without reasonable excuse, he may be liable to penalty in accordance with these rules.

## 9. Airside personnel

- 9.1 Only essential race officials, pilots and navigators are permitted to access the airside parts of the airfield during practice or race periods.
- 9.2 Pilots are responsible for their passengers, crew and guests. If any person not permitted to be airside is found to be on the airside, the pilot with whom they are associated may be liable to penalty in accordance with these rules.
- 9.3 Race officials manning the start line must not stand in line with the aircraft's propeller at any time and may only stand forward of it for the purposes of marshalling or providing a start signal.

## 10. Postponement, abandonment or cancellation

Race officials may postpone, abandon or cancel a race at any time should a valid safety reason exist for doing so.

## **ADMINISTRATION AND ORGANISATION**

### 11. Interpretation

- 11.1 Race officials shall interpret and enforce these rules to the best of their ability and in good faith.
- 11.2 The Royal Aero Club and the FAI shall be empowered to determine these rules in accordance with the requirements of these rules for protests and appeals.
- 11.3 All references to the masculine shall include the feminine and other pronouns.

### 12. Announcements

Races shall be formally announced by email no later than 21 days prior to the event at which point entries are invited. The announcement shall include any supplementary regulations that shall apply to the event including the deadline for entry submissions.

### 13. Entry submissions

- 13.1 Entries must be submitted in writing by email or by post to the person specified in the announcement and must be on the official entry form provided. Where no person is specified it shall be the aviation secretary.
- 13.2 Where submitted by post, the entry must be dispatched at a time where the entry should reasonably be received by the deadline.
- 13.3 Entries will only be accepted if they are submitted by or on behalf of a fully paid up pilot member who has no outstanding debt to the association.

### 14. Entry fees

The entry fee determined by the committee and included in the announcement must be received into the RAeC RRRRA account for the entry to be considered and in any case must be received before the deadline for entries.

### 15. Refusal of entries

If an entry is refused for any reason, the competitor must be notified no later than 14 days prior to the event or within 24 hours of receipt of entry form where the entry is received within 14 days of the event by an effective means and must state the reason(s) why his entry has been refused. Protests against a refusal must be received by the Chief Steward no later than 7 days prior to the event.

### 16. Late entries

Late entries may be considered at the discretion of the Clerk of the Course and the Chief Handicapper and may be subject to a late entry fee of £30.

### 17. Limitation of numbers

- 17.1 The RAeC RRRRA may limit the number of entrants in any given race and must state the maximum number in the supplementary regulations.
- 17.2 Where the number of entries exceeds the maximum number, entries shall be taken on a first come first serve basis.

### 18. Officials

The committee shall cause at least the following key officials to be appointed for each and every race:

- 18.1 A Clerk of the Course
- 18.2 A Chief Handicapper
- 18.3 A Chief Steward

19. Powers of the officials

The Chief Steward is empowered to endorse a competitors FAI racing licence for dangerous or unsportsmanlike conduct and is empowered to determine protests on behalf of the RAeC RRRRA.

20. Registration

All racing pilots and navigators must have completed their registration in person by the deadline. Late registrations may be considered at the sole discretion of the Clerk of the Course and the Chief Handicapper.

21. Attendance at briefings

Prompt attendance at all briefings is mandatory. Failure of a pilot or navigator to attend a briefing on time and for its full duration will result in that person being excluded from the practice or race.

22. Expenses

Only certain designated officials may claim reasonable expenses incurred in connection with the event in accordance with the associations expenses policy in force at the time of the event.

23. Supplementary regulations

The officials shall cause supplementary regulations to be published at the time of announcement of the event which shall determine the event specific regulations and shall be treated as if they were a part of these rules.

24. Insurance

The competitor undertakes to insure him/herself, his/her pilot(s) (if not the same person), crew/passengers, representatives and employees, against all damages, claims and demands whatsoever in connection with all Air Racing for a minimum of third party liability to at least the minimum value of mandatory insurance required under EC regulation EC785/2004 or as amended and this cover must hold harmless the Royal Aero Club Records, Racing and Rally Association Ltd by stating the following:

I. The Royal Aero Club Records Racing and Rally Association, its Directors, Officials and Agents are included herein as Additional Joint Assureds.

II. It is hereby noted and agreed that Royal Aero Club Records Racing and Rally Association approved check pilots and supervisors are included as passengers under the passenger legal liability section of this policy when being carried for the purpose of training or checking a permitted pilot.

III. Insurers agree to hold harmless and waive rights of subrogation against The Royal Aero Club Records Racing and Rally Association, its Directors, Officials and Agents

IV. It is noted that this policy carries a combined single limit for liability to third parties and passengers

25. Postponement and abandonment

The officials may postpone or abandon a race or practice for any operational reason deemed necessary.

**AIRCRAFT REQUIREMENTS**

26. Identification

- 26.1 Competing aircraft must display identification numbers assigned to them by the RAeC RRRA. The numbers must be not less than 11 inches high and displayed on both sides of the vertical stabiliser and on the underside of the lowest port wing with the base of the numbers as close to the wing tip as reasonably practicable. The numbers must be of a colour that is in distinct contrast to the background.
- 26.2 Numbers allocated by the RAeC RRRA must be greater than two and less than one thousand. Pilots may request a preferred race number which should be issued to them unless it is already taken by an active pilot member. Numbers are allocated to pilot members rather than aircraft unless there are multiple pilot members sharing one aircraft in which case the number shall remain with the aircraft.
- 26.3 Numbers shall only be reserved whilst the pilot is a paid up pilot or full member of the association and for 12 months after that person ceases to be a paid up pilot or full member.
- 26.4 The race number 1 is reserved for the current British Air Racing Champion who may utilise the number if he so wishes.
- 26.5 The race number 2 is reserved for the current Total Points Champion who may utilise the number if he so wishes.

27. Minimum speed

Competing aircraft must be capable of flying at speeds in excess of 87 knots true airspeed at the highest possible sustained power setting. All assigned handicap speeds must exceed 87 knots.

28. Throttle & RPM stops and other limitations of power

- 28.1 Any competitor wishing to race an aircraft at less than full power and/or maximum RPM must contact the committee and discuss their requirements. The fitting of such devices may only be permitted with the express approval of the RAeC RRRA committee.
- 28.2 The committee may make additional rules under this rule 28 at any time and such changes will be notified to the membership as soon as practicable.

29. Fuel level

- 29.1 Competitors must declare a starting and finishing fuel level and must ensure that it is complied with. The declared starting fuel level must be within 10% of the last declared fuel level.
- 29.2 The aircraft's actual fuel level must be within 10% of its declared starting fuel level.
- 29.3 The aircraft's finishing fuel level must be such that it can fly for an additional 30 minutes at a cruise power setting.

30. Configuration changes

- 30.1 Configuration changes that have taken place since the last time the aircraft raced must be declared.

30.2 Where configuration changes have taken place, the aircraft may be subject to pre or post race adjustment at the discretion of the handicapper.

### 31. Legality

The aircraft must be legally airworthy and all necessary certificates and documentation must be valid and in place. Pilots must produce any aircraft documentation on the request of the officials.

### 32. Overall condition

Aircraft participating in an air race must be and appear to be in good condition in the interests of maintaining the reputation of the Association. Aircraft not meeting this requirement may be excluded at the discretion of the officials.

## **HANDICAPPING & COURSES**

### 33. Assumptions and conversion factors

Assumptions and conversion factors used in handicapping are to be as follows:

- The radius of the earth is 6371km
- There are 1.852km in a nautical mile
- Specific gas constant for dry air is 287.058J/kg/K
- Specific gas constant for water vapour is 461.495J/kg/K
- All turns are carried out at 60 degrees of bank/2g
- The impact of atmospheric conditions on acceleration allowance is negligible
- 1 foot is equal to 0.000164579 nautical miles
- 1kph is equal to 0.539957knots

International standard atmosphere: The international standard atmosphere shall be used for standardising aircraft performance data. For the purposes of these rules, the international standard atmosphere is as follows and the figures below are at mean sea level:

Pressure:	1013.25 hPa
Temperature:	15 deg celcius
Lapse rate (T):	1.98 deg celcius per 1000ft
Lapse rate (P):	1hPa per 30ft
Base density:	1.225kg/m <sup>2</sup> (dry air)

### 34. Formulae

There are a number of calculations that are required to determine the handicap speed of an aircraft including but not limited to:

- Determining the distance between two latitude & longitude co-ordinates
- Determining the extra distance travelled according to the radius of each individual turn
- Determining the acceleration performance of an aircraft
- Converting between true airspeed and equivalent air speed
- Converting between ground speed and true airspeed taking into account wind vectors
- Mean average of historic speed
- Determining conditions at race height with reference to conditions at sea level
- Speed/Distance/Time

All the above shall be calculated using internationally recognised and widely accepted formulae and the standard values defined in these rules. Precedence shall be given to formulae adopted by

ICAO, the FAA or the CAA. The handicapper may use alternative formulae for any given season but may not change formulae mid-season unless said formulae are proven to be mathematically incorrect in which case an immediate adjustment shall be made, and the details of the change published to all racers. If the handicapper uses a new formula, he must check the formula with test values and/or known historic data to check it for errors.

All averages shall be mean unless otherwise stated and may exclude outlying results.

All airspeed conversion calculations shall attempt to factor in actual pressure, temperature and air density at race height.

The handicapper may, subject to the agreement of the committee, use developed formulae for determining a handicap speed if it is considered to improve the accuracy of the estimate. This will be set based on historic race data collected by the handicapper from officially provided GPS. For any given season this will be fixed at the beginning of the season and may not change mid-season unless said formulae is proven to be mathematically incorrect in which case an immediate adjustment shall be made and the details of the change published to all racers.

The following formulae will be adopted for the 2021 season (and beyond if successful) to account for temperature impacts on engine performance:

Corrected EAS (into the average) =  $EAS / (1 - ((X1 * \text{Temp at race height}) - X2))$

Handicap EAS (out of the average) =  $\text{Average Corrected EAS} * (1 - ((X1 * \text{Temp at race height}) - X2))$

Where;

Normally aspirated engines:

X1 = 0.002113

X2 = 0.029353

FADEC turbo diesel engines:

X1 = 0.001958

X2 = 0.019465

### 35. Units of measurement

All official distances shall be in nautical miles and all official speeds in knots. All times shall be published in hours minutes and seconds.

### 36. Use of historic data

The handicapper will use historic data combined with weather data to determine the handicap speed of the competing aircraft. Up to 7 previous races will be included in the calculation where sufficient data is available. The handicapper may, at his discretion, exclude data from the calculation if they believe it may skew the result.

### 37. Use of weather data

The handicapper will attempt to use the most accurate weather data available to him to determine external race parameters e.g. wind, temperature, pressure. Acceptable data sources are; the airfield's weather station, met office forecast data, an octagon, a practice lap or some combination of these data sources. It is for the handicapper to determine which data is most likely to be the most accurate for the day's conditions.

### 38. Octagons

When a new aircraft enters a competition for which there is no historic handicap data it will be necessary to assign a speed and acceleration allowance to that aircraft. Ideally, the aircraft will be assigned values based on similar aircraft with similar configurations. Where no such similar data exists, the aircraft will fly an octagon which must be supervised if possible. The handicapper may request an octagon be flown at any time where he has reasonable grounds to suspect that the aircraft's historic data may not be valid.

Octagons shall be flown as close to race height as possible and must be straight, level and in balance with full power and max RPM selected. They shall comprise 8 x 30 second legs joined by 45 degree rate 1 left hand turns. The octagon will be recorded on an officially provided and sanctioned GPS. The GPS data will be used to calculate the first handicap speed using the rules laid out within this document.

### 39. Determination of race speed

The race handicap speed shall be determined by historic data and/or initial aircraft data established through a means described in these rules. Historic data must be stored as or converted to temperature corrected equivalent airspeed for the purposes of calculating handicap speeds. On each race day, the equivalent handicap speed must be converted into true airspeed in order to determine the time an aircraft will take to fly a perfect course, factoring in wind vectors. If a racer believes their handicap speed is incorrect, they may request to see the details of the calculation from which it is derived. The handicapper may take new information into account and re-calculate the handicap speed if they feel sufficient evidence is presented.

### 40. Determination of acceleration allowance

The acceleration allowance is an estimate of the additional time required to complete the first 1nm over the time taken at full race speed. This shall be determined from historic data and/or similar aircraft data and be fixed for the season.

### 41. Race start

Start order is determined by time to complete the course such that all aircraft should finish at the same time. The slowest aircraft starts first at the race start time. The fastest aircraft starts last. The start time for each aircraft is determined by the following formula (subject to close start delays):

$$= \text{Race start time} + (\text{slowest aircraft course time} - \text{aircraft course time})$$

The course time for each aircraft is determined by calculating the time to complete each leg using the true airspeed, optimum distance and wind arm calculation. The fixed allowance for acceleration to 1NM will then be added on to the calculated course time.

Where two aircraft are required to start less than 10 seconds apart by virtue of the above calculations then the handicapper may add an amount of time to the aircraft's start time to create separation. This time will be deducted from the aircraft's actual race time at the end of the race.

### 42. Publication of turn points

The final course with precise turn point locations is to be published at the earliest opportunity but no later than during the briefing for the first practice. This will be the final and definitive course for subsequent races. The final published turn point locations should be within 50m of the actual turn

point location. Racers should not rely on the published turn point location during the race as the actual position of the turn point marker will be used for assessing the race results.

#### 43. Timekeeping

The official race time shall be as kept by the timekeeper using the 3R's time keeping devices (Seiko electronic stopwatches). These shall be used to log the start and finish times of each racer. These times shall be used to determine the final finishing order. Where a time cannot be provided from these devices for some reason then the time as determined by the GPS's shall be used with the agreement of the officials.

#### 44. Delayed starts

Where it is necessary to delay the start of one or more racers for some reason, the timekeeper will record the delay and inform the handicapper of the scale of the delay. They will attempt to manage the delay to a whole number of seconds, with a multiple of 10. The delay will be deducted from the racers finishing time.

#### 45. Discarding of octagon data

Where a racer is participating in their first race after completion of an octagon or where a speed has been estimated based on similarly performing aircraft and where their actual race speed is more or less than 1% above or below their estimated speed, their final result will be re-calculated based on their actual race speed. Their actual race speed will then be used for subsequent handicapping and will be the first in their average. The octagon or estimated speed will be disregarded.

#### 46. Field average change

The field average shall be the mean percentage from handicap speed to actual race speed. Generally;

- for races with between 1 and 6 participants, there shall be no exclusions from the calculation.
- for races with 6 to 12 participants, the highest and lowest changes shall be excluded from the calculation.
- for races with more than 12 participants, the 2 highest and 2 lowest changes shall be excluded from the calculation.

However, the handicapper may, at his discretion, exclude any speed from the average calculation if it is significantly skewing the results.

#### 47. Valid GPS data

It is the pilot's responsibility to ensure that both the GPS's issued to him by the club are on and recording. The GPS's must be placed in such a location that they will receive a constant signal and will not become shielded. Typically this would be on the right side of the windscreen. If it is not possible to obtain sufficient GPS data from the club issued GPS's then the racer will be disqualified.

#### 48. Marking of courses

The turn points should be marked by a clear and distinct feature with a defined point or by an official RRA orange marker tent. Markers should be placed in a position that is clearly visible on approach to the turn point and not hidden behind trees or hedge rows.

## **RACING RULES**

### 49. Carriage of passengers

Competing aircraft may not carry more than one passenger who will act as a navigator and lookout. The passenger need not be qualified to pilot the aircraft unless it is a requirement of the pilot's licence, rating or medical to have a second pilot on board. Passengers must be of an age and level of responsibility that they can act as a functional member of the crew. In the case of children, they must be approved by the officials as safe to participate. Carriage of children under the age of 10 is not permitted.

### 50. Format

The format of the race governed by these racing rules is a pursuit format with a standing start. Other race formats may be organised and where the format is not a pursuit format, a clear description of the format should be included in the announcement. Further, a comprehensive set of supplementary regulations must be published which lay down the detailed rules for the race format.

### 51. Start

- 51.1 All starts shall be standing starts and the order and timing of each start shall be determined in accordance with these rules.
- 51.2 10 seconds before the next competitor's allotted start time, a flag or other visual indicator shall be raised.
- 51.3 At the competitor's allotted start time, the flag or other visual indicator should be rapidly lowered in such a way that there is no ambiguity as to whether the start signal has been given.

### 52. Speed

Competing aircraft must fly continually and consistently at the maximum possible speed achievable in the aircraft's current configuration. Deliberate slow flying is not permitted.

### 53. Turning points

The RAeC RRRA GPS unit inside each aircraft must pass to the right of each and every turn point unless otherwise stated in the briefing. It may occasionally be necessary for a scatter point to be designated as a right hand turn in which case the GPS unit must pass to the left of the scatter point. The GPS must be located inside the aircraft's cockpit area.

### 54. Level turns

Aircraft must not gain or lose any more than 50 feet whilst turning. Significant height changes in a turn are dangerous and may result in penalty, disqualification and/or endorsement.

### 55. Missed turns

If an aircraft misses a turn, it must remain clear of the course until the race is complete or re-join the course at a very shallow angle, stating its location and intentions on the radio.

### 56. Overtaking

- 56.1 Overtaking aircraft must maintain a wingtip to wingtip separation of at least 15m whilst overtaking.

56.2 Overtaking directly above or below another aircraft is strictly prohibited. The overtaking aircraft must maintain lateral separation at all times.

57. Race height and finish height

Where maximum or minimum heights are prescribed, aircraft must remain within those height restrictions on the prescribed pressure settings.

58. Finish

An aircraft finishes when it crosses a pre-determined line within its lateral limits having completed the prescribed number of laps. The aircraft can cross the finish line at any height greater than the minimum declared height and 750ft AGL. Aircraft crossing the finish line any higher than 750ft AGL may be classed as "Did Not Finish"

## **PENALTIES**

59. Over/under weight

Aircraft must be within 10% of their declared starting and finishing weight at those respective times and the stewards may weigh entrants at any time during the season without notice. The handicapper may award penalties for minor infringements and a disqualification for a major infringement. A minor infringement shall be 10-15%. A major infringement shall be greater than 15%. The penalty for a minor infringement shall be 10 seconds.

60. False declarations

Where a racer is found to have made a false declaration on their entry form e.g. failing to declare a modification to the engine, they shall be disqualified.

61. False starts

If a racer begins a take-off before the flag is dropped for them indicating the official start of their race, they will be awarded a 10 second time penalty. Where a racer begins a take-off before the flag is raised for them i.e. more than 10 seconds before their start time, they shall be disqualified.

62. Failing to comply with height restrictions

Infringements for flying outside of published height restrictions will be subject to penalties and disqualification depending on their severity;

- Minor infringements of height limits for a short duration shall not result in a penalty. A minor infringement is not more than 50 feet for not more than 5 seconds.
- A significant infringement shall result in a time penalty of 10 seconds. A significant infringement is between 50 and 100ft for not more than 10 seconds.
- A major infringement shall result in disqualification. A major infringement shall be any other infringement not described above.
- 3 consecutive minor or significant infringements in the same race shall also constitute a major infringement.

GPS altitude collected from 3R's officially provided GPS shall be used for determining low flying. The handicapper may use his discretion when reviewing the GPS data.

63. Cuts

- 63.1 A cut is when the GPS passes inside the turn point by a distance of not more than 8.5m as defined by a circle centred on the turn point.
- 63.2 Where the GPS trace passes inside the turn point by a distance not exceeding 2.5m, no action shall be taken.
- 63.3 Where a GPS trace passes inside the turn point by a distance of more than 2.5m but less than 8.5m, a time penalty of 5 seconds shall be awarded. The Handicapper has discretion to judge the marginal cases.

#### 64. Misses

Where a GPS trace passes inside the turn point by a distance exceeding 8.5m, the racer shall be disqualified. The handicapper has discretion to judge the marginal cases.

#### 65. Excess/Inadequate speed

Where a competitor's race speed differs from their handicap speed by more than 1.0% over or under the field average, they may be subject to further action as follows:

- 65.1 Where the speed is greater than 1.0% over the field average, their finishing time will be adjusted by an amount equal to the difference between their expected race time at their actual race speed and their expected race time at their handicap speed divided by 1.01 plus the field average improvement excluding all competitors subject to further action under this rule.
- 65.2 No race speeds below their actual race speed (after normalisation) that were recorded prior to the race in question shall be used for the purposes of determining future handicap speed.
- 65.3 The following is an example of how the adjustment described above shall be calculated:  
  

$$\text{Time 1} = \text{Optimum race distance} / (\text{circle fit race speed} / (1.01 + \% \text{ field average}))$$

$$\text{Time 2} = \text{Optimum race distance} / \text{circle fit race speed}$$

$$\text{Correction} = \text{Time 1} - \text{Time 2}$$
- 65.4 Where the speed is less than 1% under the field average change, the results of the race will stand but the racers actual race speed will not be included in future handicapping calculations unless this occurs on 3 consecutive occasions in which case, the results will be re-introduced into future handicapping calculations.
- 65.5 Where there is clear evidence in the race analysis data that a competitor is managing their speed the handicapper may, with the agreement of the chief steward, apply further corrections or disqualify the competitor.

The final time adjustment shall be accurate to 1/10<sup>th</sup> of a second and normal rounding shall apply.

#### 66 Breach of other rules

Where a competitor breaches these rules and there is no prescribed penalty for doing so, the Chief Steward may impose a reasonable penalty at his discretion. The Handicapper may make recommendations to the Chief Steward in this respect.

#### 67 Fines

The Stewards of the meeting may inflict a fine on any competitor, passenger or assistant who does not comply with the FAI Sporting Code, these rules, the Supplementary Regulations or instructions delivered in a formal briefing. The amount of the fine is to be reasonably determined by the Stewards but may not in any case exceed £175.

Fines must be paid within 48hrs of them being ordered. Any delay beyond this may result in suspension of the competitor until the fine is paid.

#### 68 Exclusion

The Stewards of the meeting may exclude a competitor from one or more races held at any given meeting for breach of these rules, unsportsmanlike conduct and/or dangerous flying. In the case of exclusion, any entry fees already paid shall be forfeited.

#### 69 Disqualification

The Clerk of the Course or the Chief Handicapper may disqualify a competitor from any competition in accordance with these rules.

#### 70 Suspension

In the case of serious breaches of these rules or dangerous flying, the directors of the RAeC RRRR may suspend a competitor's racing licence. Whilst suspended, the competitor may not take part, in any capacity whatsoever, in any competition held within any territory under the jurisdiction of the RAeC or within any territory in which the authority of the FAI is recognised according to whether the suspension is issued on a national or international basis. Suspension shall void any entries made for subsequent events and any fees paid are forfeited.

### **RESULTS**

#### 71 Dead Heats

71.1 In the event of a dead heat in a single air race, the result shall be determined by excess distance whereby the competitor with the shortest excess distance shall be awarded the highest place.

71.2 In the event of a dead heat in a points based competition, the winner shall be determined by the highest number of first places in the races that qualify for that competition. If a dead heat still results then it will be determined by the number of second places, then third places and so on until a winner is determined.

#### 72 Provisional results

The provisional results should be published as soon as possible after the race and should include the following information as a minimum:

- Final position
- Race number/registration
- Original handicap speed
- Measured race speed
- Optimum distance
- Measured distance
- Excess distance
- Estimated race time
- Actual race time
- Acceleration allowance
- Measured acceleration
- Cuts, misses, time penalties etc
- Close start adjustments

Provisional results must be checked and signed off by the Clerk of the Course before they are posted.

73 Final results

Provisional results shall be subject to a protest period of 30 minutes from the time that they are formally posted. If no protest is received in that 30 minute period then the results shall be declared as final. If a protest is received, heard and determined by the Stewards and it subsequently alters the results, the new results shall be posted for a further 30 minutes before they can be declared as final and so on until all protests are determined. When a protest is determined but the results are unaltered, a period of 30 minutes must be allowed for appeals prior to finalising the provisional results.

74 Publication of results

Results should be published as soon as is practicable after completion of the race and analysis of GPS data. Results must be posted in a prominent location and all reasonable efforts must be made to notify competitors that the results have been published.

75 Suspension of results

In the event that a competitor wishes to appeal the determination of the Stewards or a protest cannot reasonably be heard on the day of the race, the results of that race may be suspended until the outcome of the appeal is known. The results should be publicised as soon as the protest or appeal is closed and the awards be presented at the next RAeC RRRA event.

## **PROTESTS**

76 Right to protest

A competitor who feels aggrieved by any decision of an Official or any act or omission of a competitor or other person connected with the relevant competition shall be entitled to protest under these rules.

77 Time limit for protest

A protest as to the validity of an entry, qualification of a competitor or aircraft, length of the course or make up of the handicap must be lodged no later than 1 hour before race briefing. Where this is impractical due to timings, it shall be lodged within 30 minutes of the conclusion of the competition.

Any other protest must be received within 30 minutes of publication of the results of the relevant competition. Any protests received after this period will not be admitted and will not alter the result of that competition.

78 Lodgement of a protest and protest fee

A protest must be made in writing on an RAeC RRRA protest form and be signed by the competitor. It must clearly state the reason for the protest and reference any relevant rule(s). A protest fee of £30 must be lodged with the Stewards of the meeting. If the protest is upheld or found to be well founded, the protest fee will be refunded to the competitor.

79 Adjudication of protest

All protests are adjudicated and determined by the Stewards of the meeting. The decision of the Stewards is the final and binding decision of the RAeC RRRA but is subject to the competitors right to appeal.

#### 80 Malicious or vexatious protests and protests without foundation

Where a protest is deemed by the Stewards to be malicious, vexatious or without foundation, the protest fee is forfeited and the Stewards may inflict additional penalties on the protester.

#### 81 Re-run

In the event that a mistake is made by an Official which materially alters the result of the competition and the mistake cannot be rectified without a re-run then the Stewards may order a re-run of the competition.

### **APPEALS**

#### 82 Right to appeal

82.1 Every competitor shall have the right of appeal against a sentence or decision pronounced by the Stewards of the meeting. However, the competitor must notify the Chief Steward in writing within 30 minutes of having been advised of the decision or within 30 minutes of the re-posting of the results, whichever is the later. Failure to make this notification will result in the competitor forfeiting his right to appeal.

82.2 The full details of the appeal must be received by a director of the RAeC RRRA within 7 days of midnight following the conclusion of the competition. If no such detail is received, the competitor shall forfeit his right to appeal and may, at the discretion of the RAeC RRRA be fined for wasting the clubs time.

#### 83 Hearing by the RAeC RRRA

83.1 In the first instance, all appeals will be heard by the directors of the RAeC RRRA in a meeting of the directors held in accordance with the articles of association which must take place within 7 days of the appeal having been received. A majority verdict should be reached and the judgement received by the competitor within 3 days of that meeting.

83.2 If the competitor is not satisfied with the judgement received, notification of his intention to escalate the appeal must be received by a director within 3 days of having received the judgement. Failure to do so will result in the competitor forfeiting his right to any further appeal.

83.3 Having notified a director of his intention to escalate his appeal, the competitor must issue his appeal to the Royal Aero Club within 7 days of having received the judgement of the directors of the RAeC RRRA. Failure to do so will result in the competitor forfeiting his right to any further appeal.

#### 84 Jurisdiction of the Royal Aero Club as to appeals

Where an appeal is received by the Royal Aero Club in accordance with these rules, the Royal Aero Club shall determine how that appeal is to be heard and the timescales for reaching a judgement.

The Royal Aero Club is empowered to settle any dispute arising out of or in connection with sport aviation within its territory and its decision shall be final.

85 Jurisdiction of the F.A.I as to appeals

The FAI shall be the final court of judgement empowered to settle any dispute arising between National Aero Clubs.

86 No appeal outside of own country

When an appeal is lodged with the Royal Aero Club arising from a national event by the holder of an FAI licence issued by the RAeC RRRA, the decision of the RAeC shall be final.

87 Appeal other than by a holder of an FAI license issued by the RAeC

Where an appeal concerns a competitor who has been licensed by a foreign National Aero Club, the decision as to whether the appeal should be heard by the FAI is that of the foreign National Aero Club alone and that club is not compelled to give reasons for refusing to allow an appeal to go on.

88 Appeals against international suspension or disqualification

When an appeal is brought by the RAeC before the FAI concerning the international suspension or disqualification of one of its licence holders by a foreign National Aero Club, the introduction of said appeal will suspend the penalty until a final decision by the FAI has been given.

89 Form of national appeal

A national appeal to the RAeC RRRA shall be in writing by the appellant and must be accompanied by a non-refundable fee of £100. The fee must be cleared by the deadline for receipt of the appeal in order for the appeal to be valid.

90 Form of international appeal

International appeals may only be lodged by the RAeC. Any fee's payable to the FAI for an international appeal are payable by the appellant.

## **CHAMPIONSHIPS AND TROPHIES**

91 Inclusion in championships and trophies

91.1 Only citizens of the United Kingdom of Great Britain and Northern Ireland or Commonwealth countries are eligible to compete for the Kings Cup. Foreign nationals may participate in the race and may receive championship points commensurate with their finishing position but may not receive an award for their finishing position in that competition. Awards shall be assigned as if that person had been disqualified from the race.

91.2 Only citizens of the United Kingdom of Great Britain and Northern Ireland, Commonwealth countries or foreign nationals habitually resident in the United Kingdom of Great Britain and Northern Ireland may compete for any of the championship trophies awarded for participation in national competitions.

91.3 In order to qualify for the Kings Cup, both pilot and aircraft, although not necessarily together, must have competed for the Stewards Cup (unless cancelled) and have completed at least 2 races (not including the Stewards Cup or Kings Cup race) in the same year, all without disqualification or exclusion for an endorsable offence.

91.4 In order to qualify for the Schneider Trophy, both pilot and aircraft, although not necessarily together, must have completed at least 2 other races in the same year without disqualification or exclusion for an endorsable offence.

92 The points system

92.1 Each pilot, navigator and aircraft will be awarded points for their final result according to this table:

<b>Position</b>	<b>Points</b>	<b>Position</b>	<b>Points</b>
1 <sup>st</sup>	25	6 <sup>th</sup>	8
2 <sup>nd</sup>	18	7 <sup>th</sup>	6
3 <sup>rd</sup>	15	8 <sup>th</sup>	4
4 <sup>th</sup>	12	9 <sup>th</sup>	2
5 <sup>th</sup>	10	10 <sup>th</sup>	1

No points shall be awarded to racers who are disqualified or finish 11<sup>th</sup> or higher. Points for competitors who take the starters flag but do not finish will be determined by the order in which they retire.

92.2 The British Air Racing and Navigators Championships are awarded based on a racers best N results, where N is less than the total number of races. Should the season be impacted by cancelled races then N will be adjusted based on the number of races achieved. This will be at the discretion of the RAeC RRRRA committee.

93 The British Air Racing Championship

Shall be awarded to the pilot with the highest number of points after accruing their N best results. N is to be determined by the committee based on the number of races actually achieved during the season.

94 The Total Points Championship

Shall be awarded to the pilot with the highest number of points in the season.

95 The Saturday Challenge

Shall be awarded to the pilot with the highest number of points accrued from the Saturday races. Where there is no race on a Saturday but two races on a Sunday, the points from the first of the two races shall be included.

96 The Novice Challenge

Shall be awarded to the pilot who is in their first season and has the highest number of points of all the pilots who are in their first season.

97 The Mitel Sword

Shall be awarded to the person (pilot or navigator) with the highest number of points who is serving or who has served in Her Majesty's armed forces.

98 The Homebuilt Challenge

Shall be awarded to the pilot of the aircraft with the highest number of points that that are accrued whilst piloting a homebuilt aircraft.

99 The British Air Racing Navigators Championship

Shall be awarded to the navigator with the highest number of points after accruing their N best results.

100 No competition

Save the novice challenge, where only one person is eligible for a trophy, it will not be awarded at the end of that season. Where there is only one navigator in a season a keepsake trophy will be awarded if they are the navigator for the pilot winning the British Air Racing Championship.

101 Trophies not the leave the UK

Winners of trophies who are not habitually resident in the UK or Isle of Man may not take those trophies out of the UK or IoM without the express permission of the RAeC RRRA committee.

OTHER

102 Conduct of members

Members who conduct themselves in a manner that is unsportsmanlike or is deemed likely to bring the RAeC RRRA into disrepute shall be expelled from the association and their racing licence suspended indefinitely.