



# FAI Sporting Code Section 6

*Fédération  
Aéronautique  
Internationale*

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## Regulations for the Conduct of International Aerobatic Events

**Part 5b**

### **World Formation Aerobatic Challenge Events (WFAC)**

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# FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE

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1	FAI Statutes,	Chapter 1, para. 1.6
2	FAI Sporting Code, Gen. Section,	Chapter 3, para 3.1.3.
3	FAI Statutes,	Chapter 1, para 1.8.1
4	FAI Statutes,	Chapter 2, para 2.1.1
5	FAI By-Laws,	Chapter 1, para 1.2.1
6	FAI Sporting Code, Gen. Section,	Chapter 3, para 3.4
7	FAI By-Laws,	Chapter 1, para 1.2.3
8	FAI Statutes,	Chapter 5, para 5.2
9	FAI Sporting Code, Gen. Section,	Chapter 3, para 3.1.7
10	FAI Sporting Code, Gen. Section,	Chapter 1, paras 1.2. and 1.4
11	FAI Statutes,	Chapter 5, para 5.2.3.3.7
12	FAI Bylaws,	Chapter 1, para 1.2.2



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## **1 GENERAL RULES FOR FORMATION AEROBATIC CHALLENGE EVENTS (WFAC)**

### **1.1 Aims of Formation Aerobatic Challenge Events**

1.1.1 The key objectives at WFAC events are:

- a) To establish the overall World Formation Aerobatic Challenge winners in Classic and Signature divisions.
- b) To promote and popularise aerobatics and to develop and foster friendly relations between aerobatic pilots of different countries.
- c) In pursuance of these aims and in case of dispute over the interpretation and application of these rules, and any other regulations for the conduct of aerobatic challenges and competitions, a competitor shall be entitled to the benefit of reasonable doubt.

### **1.2 General Regulations**

#### **1.2.1 Formation Aerobatic Challenge Events**

1.2.1.1 WACL and CIVA will work together to achieve the following:

- i) WFAC events will be held on multiple occasions each year as arranged by WACL. The duration of WFAC events is expected to be 5 days, including two full practice / training days and three days of competition.
- ii) The organisation and control of WAM events will be shared between WACL and CIVA officials, as generally defined in their joint agreement of June 2016.
- iii) WACL will provide conditions for entry and participation for any selected pilots, and will carry out the WAM event on the basis of the decisions and rules of WACL/FAI/CIVA.
- iv) The working language of WAM events both orally and in writing for all purposes for the duration of the championships will primarily be English, supported by Chinese interpretations where necessary.

#### **1.2.2 Aircraft Categories**

1.2.2.1 WFAC events will be open to competing formation teams using their own aircraft.

#### **1.2.3 Number of Competitors**

1.2.3.1 WFAC events will normally comprise 5-12 competing teams each with 2-6 individual aircraft.

#### **1.2.4 Entries**

1.2.4.1 Competitors selected by WACL and approved by CIVA must complete all relevant entry forms as specified and provided by WACL.

#### **1.2.5 Competitors and aircraft**

1.2.5.1 All flights carried out by competitors at WFAC events must be made in team formation, with brief solo performances as a planned part of these flights.



1.2.5.2 A contest aircraft may on the recommendation of the technical commission, and with the permission of the International Jury, be replaced at any time by another contest aircraft.

### 1.2.6 **Aircraft Documentation**

1.2.6.1 All competing aircraft must meet the performance characteristics required for the kind of flight they will be undertaking. A valid aerobatic certificate of airworthiness or equivalent document issued by the competent aviation authority of the aircraft's country of registration must be produced to the organisers for every aircraft participating.

1.2.6.2 Aircraft will not be admitted to the contest unless the appropriate documentation has been submitted to the organisers.

### 1.2.7 **Air Safety**

1.2.7.1 All competitors must observe and adhere to the regulations currently in force in the host country for air safety as well as the special regulations in force at the contest aerodrome. To facilitate this, the organiser must ensure that an English translation of applicable rules, issued by the Aviation or Customs Authorities of the host country, is available in advance in a bulletin or on the competition website.

1.2.7.2 Any violation of the safety regulations in force may at any time render the offender liable to exclusion from the contest. No responsibility will be undertaken by the organisers for any such violation by competitors or others.

1.2.7.3 To enable the pilot to watch over his or her own safety, an accelerometer must be installed in each competing aircraft.

1.2.7.4 The Flight Director or the Chief Judge may exclude a team or a pilot who is not flying safely or could cause an unsafe situation, after issuing a radio "Stop" call. This would apply from take-off to touchdown.

1.2.7.5 Any competitor required to interrupt a competition flight due to danger of collision with conflicting air traffic or a bird should orbit in a safe place or if necessary land immediately until the conflict is resolved. In this event, the Chief Judge will communicate with the competitor and allow additional time if appropriate.

### 1.2.8 **Insurance**

1.2.8.1 The organisers will provide a promoter's liability insurance of value 25 million EUR to indemnify all contest staff including FAI and CIVA officers against third party risks for the duration of the contest covering functional test flights, training and competition flights that must cover all pertinent legal requirements of the country in which the championship or competition is held.

1.2.8.2 All competitors must produce evidence of adequate third party insurance of value 10 million EUR valid for the duration of the contest and valid in the organiser's country – see Appendix 1 of WFAC Event Regulations.

## 1.3 **Classification of Programmes**

### 1.3.1 **Programme Formats**

1.3.1.1 The flight programmes at WFAC events will be:





- a) Programme 1: The Classic Programme
  - b) Programme 2: The Signature Programme
- 1.3.1.2 At no time may any team or pilot fly over the crowd side of the official deadline. The use of 'Rear arrivals' for any programme is thus prohibited.
- 1.3.1.3 Winners and Awards
- 1.3.1.4 Winners of flight programmes will be:
- a) **Winner in the Classic Programme:**  
The team who gains the highest number of points in Programme 1.
  - b) **Winner in the Signature Programme:**  
The team who gains the highest number of points in Programme 2.
- 1.3.1.5 Winners, second and third placings in the various programmes will be awarded Gold, Silver and Bronze medals and Diplomas of the FAI.
- 1.3.1.6 The Overall WFAC winner will be awarded the Gold Medal and Diploma of the FAI; the second and third placings will be awarded a Silver or Bronze Medal respectively and Diplomas of the FAI. The fourth and all lower placings will be awarded Diplomas of the FAI.
- 1.3.1.7 The organisers are recommended to give awards at WFAC events to the Chief Judge, the Panel of Judges, and other key CIVA and/or local officials at the event.
- ## 1.4 Contest Bodies
- 1.4.1 **The International Jury**
- 1.4.1.1 The International Jury is the supreme arbitration body of international aerobatic events and shall be responsible for:
- a) Interpreting the general rules, the judging rules and the general regulations of the contests;
  - b) Supervising the activities of the Chief Judge and the Board of Judges; during judging, a member of the International Jury must not remain in the vicinity of the International Judges;
  - c) Dealing with protests from competitors;
  - d) Overseeing the administration of the contest.
- 1.4.1.2 For WFAC events the International Jury chairman will be either a Delegate to CIVA or a qualified person nominated by the CIVA Bureau. Two other International Jury members shall be nominated by the chairman from appropriately qualified officials at the event. The Chief Judge, the Flight Director and the Event Director shall be advisers to it.
- 1.4.1.3 All three members of the International Jury must be available to hear appeals or protests submitted by competitors.
- 1.4.1.4 Any decision taken by the International Jury by majority vote is final.



- 1.4.1.5 The International Jury may temporarily vary any rules approved by the International Aerobatics Commission (CIVA) during a contest under the following circumstances:
- 1.4.1.6 There is simple majority within the International Jury, with no abstentions, when conducting a vote to introduce a temporary variation to the regulations, and
- 1.4.1.7 There is at least a two thirds majority in agreement amongst the participating pilots, with no abstentions, when conducting a vote to introduce a temporary variation to the regulations.
- 1.4.1.8 In the event that the rules of the Sporting Code are not adhered to at a WFAC, or if the International Jury is not provided with sufficient information to perform their duties in accordance with the rules, the International Jury may stop the contest until matters are remedied. If remedial action is not taken, the International Jury has the power to declare that the requirements of a WFAC have not been fulfilled in accordance with the. If this latter action is taken, the International Jury shall prepare a full report for submission to the next meeting of CIVA at which their decision shall either be endorsed or reversed.
- 1.4.1.9 Meetings: The International Jury will:
- a) Attend the meetings of the International Board of Judges (dealing with familiarisation, evaluation, checking the marking sheets).
  - b) If required, hold daily evaluation meetings (after the daily contest programme has been completed).
  - c) Hold a final meeting to evaluate the activities of the International Jury and the development of the contest and for the chairman to prepare his report to CIVA.
- 1.4.1.10 Supervision: The International Jury will:
- a) Directly supervise the International Board of Judges.
  - b) Supervise the appointed Deadline Judge(s), and check the operation of the sighting device used by the Deadline Judge(s).
  - c) Supervise the activities of the scoring office.
  - d) Supervise the activities of the meteorological centre.
  - e) Check the publication of contest results; make visits to the pilots' camp to gather or give information.
  - f) Supervise briefings and the secret drawing of lots.
  - g) Check the availability and correctness of medals and trophies at the beginning of the competition.
- 1.4.1.11 Mediation: The International Jury will:
- a) Discuss protests, if necessary in cooperation with the Chief Judge, the Flight Director and the Event Director.
  - b) Take down on record the proceedings in meetings or activities where decisions are sought (e.g. a note of comments, resolutions, etc.). The International Jury will publish



the results of all protests and decisions. Meetings of the International Jury must not impede the progress of the contest.

- c) Hold explanatory discussions with competitors to explain measures taken by the Jury; interpretation of the FAI Sporting Code and all regulations. This should be done after completion of the daily competition flying or before the beginning of competition flying (i.e. in any case without impeding the progress of the contest).
- d) Control the Unknown Programmes including supervision, composition and explanation, as appropriate.

#### **1.4.2 Protests**

1.4.2.1 Protests will be accepted from teams only. They will be dealt with in compliance with the FAI General Section of the Sporting Code, Chapter 5. All protests must be submitted to the President of the International Jury in writing, either directly or through a member of the jury, with a deposit, not later than two hours after the occurrence, decision or publication of results which causes the protest to be made. "Non-working" hours, as defined in local regulations for the World Air Games will not be counted. Every protest must refer to the rule or rules to which it relates. The amount of the deposit shall be stated in the local regulations. It should not exceed 100 USD.

1.4.2.2 The deposit will be returned if the protest is upheld. The International Jury may request the attendance of the protesting competitor if it considers this desirable. The decision of the International Jury is final.

1.4.2.3 Organiser's Responsibility

1.4.2.4 The organisers of international aerobatic events must provide the necessary material and technical conditions and the required number of staff in order to enable the International Jury to carry out its functions.

#### **1.4.3 Board of Judges**

1.4.3.1 Judging during WAM events will be carried out by an International Board of Judges nominated by CIVA.

1.4.3.2 Judges will be supported by one (1) Assistant each, nominated by CIVA.

1.4.3.3 The contest organiser shall provide accommodation, food and local transport to all Judges and their assistants.

1.4.3.4 At WFAC events the International Board of Judges will be composed of:

1.4.3.5 The Chief Judge, who throughout the event will be a scoring Judge;

1.4.3.6 Between 3 and 5 International Judges each supported by one Assistant for marking the quality of aerobatic manoeuvres and their positioning.

1.4.3.7 Additional judges with specific experience of formation aerobatic flying may be nominated by WACL and approved by CIVA; their judgements will be of equal value to those of the CIVA Judges.



- 1.4.3.8 WACL may also seek judging input from other sources via electronic means, in which case their value shall be applied at an appropriately modified scale.
- 1.4.3.9 At least one and preferably two Deadline Judges for recording and validating violations of the prescribed event deadline.
- 1.4.3.10 The International Judges appointed for marking the quality of the manoeuvres will mark the manoeuvres and infringements of the lower and upper height limits in compliance with the judging rules.
- 1.4.3.11 The Assistants have the following tasks:
- 1.4.3.12 Telling the Judge prior to the performance the sequence of the figures, details of the various figures, and any other special features.
- 1.4.3.13 Recording the mark given by the Judge for each figure and when required recording any remarks concerning the rating. Any amendment of record must be signed by the Judge.
- 1.4.3.14 Providing general assistance.
- 1.4.4 **Contest Management**
- 1.4.4.1 The contest management will be composed of:
- 1.4.4.2 The Event Director
- 1.4.4.3 The Flight Director
- 1.4.4.4 The Chief Judge
- 1.4.4.5 The Technical Commission
- 1.4.4.6 The Event Director (ED) will be a local WACL appointment responsible for managing event finance, infrastructure and domestic arrangements, the operation of the scoring systems and equipment, and the efficient administration and orderly performance of the contest.
- 1.4.4.7 The Flight Director (FD) is responsible for the management and presentation of the flying competition. The FD controls day to day aviation activities including liaison with local ATC and airfield services, daily briefings, management of the Technical Commission, safety and working with the Chief Judge to enable the completion and swift execution of all air-side movements, both on the ground and in the air.
- 1.4.4.8 The Chief Judge (CJ) is responsible for management of the judging panel, the determination of matters related to penalties and disqualifications, the timely output of accurate results, and oversight of flight safety in the performance area.
- 1.4.4.9 The Technical Commission (TC) will comprise two aviation qualified engineers selected on a rota basis from among those supporting aviation services at the competition, responsible to the FD for the rapid interpretation and resolution of technical issues affecting flight performances. An issue related to an aircraft for which one of the selected engineers is normally responsible will be the primarily responsibility of the other.



## **1.5 Final Regulations**

### **1.5.1 Interpretation**

1.5.1.1 International aerobatic events will be carried out in compliance with the published WAM/CIVA Regulations and local regulations of the organisers.

1.5.1.2 Any differences arising during an event will be dealt with by reference to the above rules. For the interpretation of the text at championships, a standard version written in English shall be taken as the authority.

### **1.5.2 Competitors' Pledge**

1.5.2.1 All competitors undertake, by signing the entry form, to comply with the General Section of the Sporting Code of the FAI, the Regulations of CIVA.

## **2 JUDGING RULES FOR WAM EVENTS**

### **2.1 Control of Timing**

#### **2.1.1 Responsibilities of the Chief Judge**

- 2.1.1.1 Recording programme interruptions and giving penalty points for such interruptions or for infringements of the lower and upper height limits, infringements of the performance zone and awarding penalties thereto will be carried out under the responsibility and control of the Chief Judge.

### **2.2 Deadline Judging**

#### **2.2.1 Deployment of Deadline Judge(s)**

- a) The use of at least one Deadline Judge and preferably two is mandatory at WAM events.
- b) Deadline Judges shall be placed at both ends of the officially established deadline, or if only one then at the most advantageous end of the deadline for the purposes of accurately detecting deadline infringements.
- c) Competitors are not allowed to approach the deadline judge positions closer than 20m and in any case must not communicate with the deadline Judges.
- d) Deadline Judges will be equipped with aiming devices of sufficient accuracy and communications to enable immediate contact with the Chief Judge's workstation. Deadline infringements will be reported in real time and recorded at the Chief Judge's station.

### **2.3 Judging Administration**

#### **2.3.1 Collection of Marking Sheets**

- a) The Judges grades will normally be received in 'real time' by the electronic scoring system in use at the event.
- b) If paper scoring sheets are used then immediately after a competitor has completed a competition flight and the judges have finished marking, the marking sheets will be collected for perusal at the Chief Judge's workstation. Once any required actions are taken (conference, penalties added, zeroes checked etc.) the marking sheets will be forwarded to the scoring officer for entry into the scoring system. The individual judges themselves must sign off any changes to their marking sheets.
- c) Once the electronically recorded marks or the paper marking sheets have left the Chief Judge's workstation, they come under the supervision and jurisdiction of the International Jury.

#### **2.3.2 Publication of Results**

- 2.3.2.1 The total results for each team in each of the competition flights shall always be available to the teams in the agreed working language(s), prior to the start of the next programme.

#### **2.3.3 Public Announcements**

- 2.3.3.1 Prior to the take-off for and during the performance of a programme, details concerning the team concerned may be published by any means (radio commentary, etc.).

#### 2.3.4 **Protests, Decisions of International Jury, Confidentiality**

- 2.3.4.1 All protests will be dealt with by the International Jury in cooperation with the Flight Director and the Chief Judge if their assistance is required. Decisions taken by the International Jury are final and must not be changed later. Judges are advised to keep activities of the Board of Judges and of the International Jury strictly confidential.

### 2.4 **Evaluation of the Performance**

#### 2.4.1 **Judges**

- 2.4.1.1 Each programme of WFAC events will be marked by the Judges using a standardised system (see Appendix A).
- 2.4.1.2 Where the majority decision of the Panel of Judges is required, in a case of disagreement about the penalisation of the flight of a competitor, the Chief Judge shall have a casting vote in the event of a tie.

#### 2.4.2 **Marks awarded**

##### 2.4.2.1 Classic Programmes

- 2.4.2.2 The Judges will independently mark the quality of each Classic programme figure and its components, marking with integer numbers 0 to 10 in intervals of 1 using the point reduction system for each element of a figure as described under paragraph 2.6. A Zero mark will be awarded if the figure is incorrect or missing.

- 2.4.2.3 The teams may fly additional simple manoeuvres to reverse or change the direction of flight between the set programme figures. These will be judged within the overall Presentation grade.

- 2.4.2.4 Once horizontal flight path is established at the end of a figure in a Classic sequence, the beginning of the next figure is considered to have occurred.

##### 2.4.2.5 Signature Programmes

- 2.4.2.6 The judges will independently mark the quality of the performance with integer numbers 0 to 10 in intervals of 1 within the ten flight regimes detailed in the WFAC Signature score sheet.

- 2.4.2.7 The judging of each performance will commence at the moment the team turns their smoke ON with radio call "SMOKE TIMING ON" and will cease when their smoke is turned OFF with radio call "SMOKE TIMING OFF". If the performance extends beyond 12 minutes the Chief Judge will indicate to the panel when they should cease judging the flight, and they will ignore any manoeuvres after this time.

#### 2.4.3 **Calculation of Scores**

- 2.4.3.1 The calculation of scores for a team's programme will be as follows:

- a) The raw marks given by a Judge are normally used without modification. The scoring system may however employ simple arithmetic or statistical means to identify any mark(s) that are unusually different to the marks awarded to the same figure by the other judges, and substitute a calculated replacement mark. Such substitutions will be

confined to the affected figure and will have no effect on marks awarded to other figures.

- b) It shall be a duty of the organiser to arrange for the publication of the competition results in accordance with rule 2.3.2. The marks must be made available to the competitors and Contest Officials for information and/or checking before the start of the subsequent programme.

#### 2.4.4 Video Recording

- 2.4.4.1 An official video recording shall be made from the Judges' position of every individual competition flight. This recording shall be available to the International Jury to assist their decision on any protests. The recording shall not be available to teams, except in the clarification of a protest in conjunction with the International Jury and with their agreement. The official recording shall also be available to the Chief Judge and the Board of Judges to assist their discussion on matters of fact.
- 2.4.4.2 After the completion of the championships, the recording may be released by the organisers for use in training.

### 2.5 The Penalty Point and Devaluation System

#### 2.5.1 Infringements of Height Limits

- 2.5.1.1 A team flying a figure or part of a figure lower than 50m AAL (above aerodrome level) will receive 70 penalty points for this figure. A team flying a figure or part of a figure lower than 25m AAL will be disqualified for this programme. The height of the aircraft is deemed to be at the height above datum of the pilot's eyes.
- 2.5.1.2 A competitor flying a figure or part of a figure lower than 10m AAL (above aerodrome level) will receive 70 penalty points for this figure. A competitor flying a figure or part of a figure lower than 5m AAL will be disqualified for this programme. The height of the aircraft is deemed to be at the height above datum of the pilot's eyes.
- 2.5.1.3 In the case where the Judges assess the lower boundary, each Judge will note in writing a height infringement on his score sheet, independent of the other Judges; however, he continues to evaluate the figure being flown.
- 2.5.1.4 When infringements of the lower height limits are estimated by the judges, they will be penalised only if a simple majority has recognised the violation and duly recorded this on their marking sheets. In case the required simple majority could not rise from a vote within the Board of Judges, the Chief Judge shall have a casting vote.
- 2.5.1.5 The final decision as to whether a penalty should be applied rests with the Chief Judge.
- 2.5.1.6 The final decision as to whether disqualification should be applied for the programme or for the entire event rests with the Chief Judge and the agreement of the International Jury.
- #### 2.5.2 Infringements of the Deadline
- 2.5.2.1 All instances of a team or a competitor crossing the Deadline shall be immediately reported by the Deadline Judge(s) to the Chief Judge and the Flight Director.





2.5.2.2 On receipt of a Deadline infringement report the Chief Judge and/or the Flight Director shall immediately contact the team by radio and instruct the pilot to return at once to the performance zone.

2.5.2.3 If the Chief Judge and/or the Flight Director consider the infringement sufficiently serious the team shall instead be instructed via a radio “Stop” call to cease their aerobatic performance and must land immediately.

2.5.2.4 An instruction to land due to a deadline infringement may result in disqualification from either the programme or the entire event. The final decision on this matter shall be determined by the Chief Judge in consultation with the International Jury.

### **2.5.3 Programme Interruptions**

2.5.3.1 If a pilot is compelled to change his direction or reposition the aircraft after a mistake or if too low or after an abandoned figure in order to resume the predetermined direction and has already received a Zero mark for that figure, no penalty points for an interruption will be subtracted.

### **2.5.4 Violation of Flight Regulations and Dangerous Flying**

2.5.4.1 Teams or pilots found guilty of violating flight regulations and/or causing a dangerous situation will, on the recommendation of the International Jury, be disqualified by the Flight Director.

2.5.4.2 The Chief Judge may disqualify a team or a pilot who is not flying safely or in his opinion could cause an unsafe situation, by issuing a radio “Stop” call. This would apply from take-off to touchdown.

## **2.6 Rules for the Marking of Figures**

### **2.6.1 The mark for each figure**

2.6.1.1 It is assumed by a Judge that a team is going to fly a perfect figure; therefore they start with the grade of 10 for each figure and the judge downgrades this mark by fixed values as prescribed herein and by further values in conformity with the Judging Criteria in Appendix A.

2.6.1.2 The scores will be calculated by multiplying the coefficient (K) for each figure by the mark awarded to each one.

2.6.1.3 When marking the quality of the performance of individual figures, the Judges have to consider the following general principles:

- a) the geometry of the figures (including shape, radii, angles, plane of flight, direction of flight, formation station keeping and, where prescribed, formation changes), which must be in compliance with the prescribed criteria;
- b) the precision of the performance, for which there are marking criteria set out in Appendix A;
- c) the distinctly recognizable start and finish of each figure with a horizontal line;
- d) the figure flown must be in accordance with the pre-stated figure in the original sequence;

- e) that in judging a figure which comprises a combination of manoeuvres, the marking criteria of its various components continue to apply, but the combined manoeuvres are to be taken as a unit;
- f) that the length of lines and the size of radii caused by the flying characteristics of an aircraft are not to be taken into account in the marking;
- g) that inverted parts of figures are judged by the same criteria as upright parts of figures.

2.6.1.4 Once horizontal flight path is established at the end of a figure in a sequence, the beginning of the next figure or an axis change manoeuvre is considered to have occurred.

2.6.1.5 If a judge misses seeing a figure, or any part of a figure, such that a grade cannot be given with full confidence, the Judge will give a mark of “Average” or “A” to that figure.

## 2.6.2 Downgrades

2.6.2.1 For deviations from the correct geometry (plane of flight, direction of flight, angle of bank) and for deviations from the proper flight path or the proper attitude (as appropriate), the mark will be reduced by 1 point per 5 degrees of deviation.

2.6.2.2 Formation station keeping will be assessed for smoothness, spacing, symmetry, balance (skid/slip) and optical correction. Formation changes will be assessed for safety, speed of change and symmetry. The mark will be reduced by 1 point per observed error.

2.6.2.3 If within a figure two or more lines have to be of the same length, the basis for judging is the first line flown. Any observed variation must be penalised by reducing the marks in accordance with Section 6 Part 1 paragraphs B.8.1.12 and B.8.1.13. Note however that the disparity in line lengths before and after superimposed rolls will not be considered a downgrade.

2.6.2.4 For an individual aircraft, over-rotating a roll and rolling the wings back again must be penalised by 1 point per 5 degrees of the over-rotation only, even if the correct geometry is resumed afterwards, no matter how quickly the correction is made. The same provisions apply when, at the end of a loop or part-loop, the aircraft is pitched beyond the desired line and then brought back again.

2.6.2.5 If the total of downgrades in this section leads to a value lower than the score of 1.0, a valid mark of 0.0 will be given to the figure.

## 2.6.3 The mark of Zero

2.6.3.1 A grade of Zero should be assigned if the judge considers that the figure is incorrectly flown in respect of a geometrical error, as listed below, which is clearly verifiable as a matter of fact. A grade of Zero will be appropriate if:

- a) Any figure is flown which does not conform to the drawing held by the judges for marking purposes.
- b) Any deviation from the prescribed direction reaches 90 degrees.
- c) Any other single deviation in geometry/flight path/attitude/rotation reaches 90°.
- d) The pre-stated figure or any part of it is omitted.



- e) Any part of the figure was not visible as it was flown in or behind cloud. If the figure was visible to a majority of judges, then the Chief Judge should instruct unsighted judges to revise their mark from Zero to "A".
- f) After a directional deviation of 90 degrees or more on the Y Axis, although it is non-directional, the original direction must be re-established before the next figure is flown. If figures subsequent to a Zero grade are correct and are flown in the correct direction, they shall be marked in the normal way.
- g) Any break of formation position by a wingman. A break is considered to be at least 3 aircraft lengths from the datum position.

## **2.7 Code of Practice for The Chief Judge and Board Of Judges at WAM events**

### **2.7.1 The Chief Judge**

- 2.7.1.1 The Chief Judge's primary concern should be the accurate and fair judging of the competition flights, including the monitoring of flights for Zero marks and penalties. He should place his expertise at the disposal of the Board of Judges, and coordinate and guide their work.
- 2.7.1.2 The Chief Judge oversees administrative matters (correctness of paperwork, recording of penalties, etc.) and has an Assistant who will perform at least the following tasks along with other duties as requested:
  - a) Calling the manoeuvres and recording the notes of the Chief Judge.
  - b) Processing and expediting the flow of paperwork.
  - c) Receiving and recording the calls of the Deadline Judges.
  - d) Handling all other radio communications.
- 2.7.1.3 The Chief Judge shall brief and direct a pilot nominated by the organisers to demonstrate the 'low' and 'disqualification' heights around the performance zone prior to the commencement of contest flying each day.
- 2.7.1.4 The Chief Judge is responsible for ensuring that there is enough time between flights for the judging to be unhurried. He should control (by radio) the flow from one contestant to the next.
- 2.7.1.5 At the end of each flight, the Chief Judge should ascertain whether any of the Judges have recorded a Zero mark, height penalty, interruption penalty. This will be done by perusal of the electronic marks gathering system, or of the score sheets collected from the judges prior to entry into the scoring system.
- 2.7.1.6 In the case of a difference of opinion with regard to a Zero mark, height penalty or interruption penalty, a judging conference will always be held to resolve differences. The official video shall be available to assist in such discussions when it concerns a matter of fact.
- 2.7.1.7 During such a conference a Judge may request a viewing of the video, and this may not be refused by the Chief Judge.



## **2.7.2 The Judges**

- 2.7.2.1 A Judge may only reconsider his marks as long as his score sheet is still in his possession or if asked to do so at the request of the Chief Judge. Once entered into the scoring system, the scoring sheet comes under the jurisdiction of the International Jury. The judge himself must sign off any changes on the score sheet.
- 2.7.2.2 Judges must record as many comments on the score sheets as possible, with particular reference to significant errors. They may make these comments in any language or form, provided that they are able to explain the comments if required.
- 2.7.2.3 A judge will not make improper communication to third parties by means of cell phone, radio, or other device whilst on the judging line or during breaks/lunches.
- 2.7.2.4 All paperwork supplied to the Board of Judges except that specifically prepared for use by the Chief Judge and the video operator should have all references to the pilots' identity removed.



### **3 THE ORGANISATION OF WFAC EVENTS**

#### **3.1 Administrative Arrangements**

##### **3.1.1 Accommodation, Food, Medical Services**

3.1.1.1 At WFAC events the organisers will provide adequate accommodation and food for the duration of the event to all members of official teams, competitors, officials and other assistants for whom entry fees have been paid.

3.1.1.2 The organisers will be responsible for adequate medical services being available to all official participants.

##### **3.1.2 Technical Services**

3.1.2.1 The organisers will provide technical assistance and hangarage for competing aircraft, if required.

##### **3.1.3 Interpreters**

3.1.3.1 Interpreters for the official language(s) of the contest, working together with the International Jury and the Board of Judges, will be provided by the organisers. The official language will be English.

##### **3.1.4 Briefings**

3.1.4.1 Prior to the beginning of competition flights on each competition day, a briefing will be held for competitors, Officials, Judges, and the International Jury on organisational matters, concerning the competition day, meteorological conditions, etc. The briefing should last no longer than 30 minutes, and should cover at least the following basic elements:

- a) All officials should be introduced, by name and responsibility.
- b) The importance of safety, with particular respect to the extent of the usable performance zone, the maximum and minimum allowed heights, and the signing of the daily Contestants Declaration Form.
- c) A clear description of the performance zone, the location and direction of the main axis, and the deadline or crowd line that must not be crossed.
- d) The local current and expected weather, as it affects the planned flying.
- e) Local facilities that all competitors and officials may use.
- f) Emergency response actions for everyone.
- g) The safety RT frequency to be used, the procedures for flight authorisations, recalls etc.
- h) Start-up, taxi, hold and release procedures by radio and flag.
- i) The order of flight.
- j) Questions / AOB.
- k) Time check.



### **3.1.5 Training Flights**

- 3.1.5.1 Each team at WFAC event will be given the opportunity to make training flights of their Classic and Signature programmes over the performance zone for familiarisation with the local conditions.
- 3.1.5.2 There will normally be two days allotted for training sessions which must be completed prior to the formal opening of the event.
- 3.1.5.3 Training flights are subject to the same safety regulations and minimum heights as contest flights, and will be conducted according to a starting list produced by the organiser.
- 3.1.5.4 For Training flights, Visual Flight Rules (VFR) of the organising country must be observed, but the stated contest weather minima need not be fulfilled.
- 3.1.5.5 No further training flights are allowed after the start of the Challenge. The International Jury may authorise additional familiarisation flights after the opening of the contest for weather or other compelling reasons.
- 3.1.5.6 If it is necessary for purposes of media coverage, teams and/or competitors may be authorised to fly a demonstration programme which must be approved by the International Jury, the Chief Judge and a two-thirds majority of the competitors.

### **3.1.6 Sequence of Flights (Drawing of Lots)**

- 3.1.6.1 The sequence of flights for all Programmes will be determined by drawing of lots to be arranged by the Event Director or his Assistant, in the presence of a representative of the International Jury. Each competitor will draw his or her own lot.
- 3.1.6.2 The order of teams determined by lot may be altered with the approval of the International Jury if special circumstances require. After any drawing of lots, the first competing team should have an allowance of one hour between drawing of lots and taking off.

## **3.2 Operating Regulations**

### **3.2.1 Video/Audio Devices**

- 3.2.1.1 Video cameras may be mounted in/on competition aircraft.
- 3.2.1.2 The use of technical devices to convey audible or visual information to the pilot is not permitted during International Aerobatic Contests, except for standard air-ground radio sets. Radios should be set to the official safety frequency which is published in the local regulations. The safety frequency is used only to convey urgent competition or flight safety instructions.
- 3.2.1.3 Once each team is airborne they are not allowed to enter the Performance Zone before two-way communication is established with the Chief Judge. The Chief Judge will call the team leader on the safety frequency, saying: "Team x, radio check". If the team does not receive this call, after a reasonable time and visually checking that no other aircraft is flying in the Performance Zone, the formation leader should call the Chief Judge on the safety frequency and state, "Team x, radio check." The Chief Judge must respond to this call if he hears it. If two-way communication is not established, the team must land immediately.



- 3.2.1.4 The standard phraseology in the event that a break is required for safety reasons will be the Chief Judge or the Flight Director saying “Stop, stop, stop”. The team must immediately stop aerobatic manoeuvring and return to upright level flight, and the CJ or FD will provide instruction as circumstances require. A team who fails to comply with any of these instructions from the Chief Judge or the Flight Director shall be liable to disqualification from that Programme.
- 3.2.2 **Meteorological Conditions**
- 3.2.2.1 Competition flights will be carried out between sunrise and sunset at the place of the competition. If weather conditions deteriorate within this time, the International Jury, in consultation with the contest management, will decide upon the start and finish of competition flights.
- 3.2.2.2 The following meteorological conditions must be met:
- i) The performance zone must be free of clouds. Below 250m (820ft).
  - ii) The flight visibility, determined with reference to ground features from the midpoint of the performance zone, must be a minimum of 2km.
  - iii) The maximum permissible average wind speed in the performance zone should be 15m/s.
  - iv) The performance zone must be free of precipitation.
- 3.2.2.3 The Event Director provides the competitors, the Chief Judge, the Board of Judges, and the International Jury with regular information on weather conditions at hourly or shorter intervals if required by meteorological development. The information on wind speed and direction will be published on a board at the flight line, and must include the time of the measurement as well as the publication time.
- 3.2.2.4 Under stable weather conditions adequately meeting the above conditions, hourly information is not required. The International Jury will decide upon the necessity of providing this information.
- 3.2.2.5 The International Jury shall provide the Official Wind Direction to the Chief Judge and the Event Director before the start of each contest day and at any time it is determined that the Official Wind Direction must be changed. The decision with regard to the Official Wind Direction, always aligned with one of the performance zone axes, must take into account the predominant direction of the actual prevailing wind.
- 3.2.2.6 The Flight Director, after consultation with the International Jury, will discontinue competition flights if meteorological conditions deteriorate below the specified minima. Such decision may be taken:
- i) If the visibility is judged independently by members of the International Jury, the Chief Judge, the Flight Director or competitors to be below the minimum.
  - ii) If there are clouds or precipitation in the performance zone.



### **3.2.3 Competition Flights**

3.2.3.1 Teams are encouraged to use smoke throughout all programmes, except where in their opinion the performance is enhanced by discontinuing the smoke for short periods.

3.2.3.2 The organisers of WFAC events must establish an efficient radio or telephone communication system between the Contest Officials (Event Director, President of the International Jury, Chief Judge, Flight Director and all Deadline Judges) in order to supervise the running of the contest and the contest rules.

### **3.2.4 Performance Zone**

3.2.4.1 The performance zone will be a rectangular area approximately 500m wide by 1500m long.

3.2.4.2 Marking of flight positioning and symmetry during all flights will be carried out by the Board of Judges in accordance with Section 6 Part 1 paragraph 4.1.5.

### **3.2.5 Programmes at WFAC events**

3.2.5.1 The event consists of the following two programmes:

- i) Classic Programme 1
- ii) Signature Programme 2

3.2.5.2 The above sequence of programmes is mandatory. Any changes due to weather or other compelling reasons must be authorised by the International Jury.

3.2.5.3 Classic Programme 1

3.2.5.4 The sequence for this programme will be designed by each team. This will comprise the five mandatory figures plus three others selected from those shown in Appendix A. Additional manoeuvres may be added to reverse or change the direction of flight as required.

3.2.5.5 Solo Items: During the A signature sequence a team is permitted to present a solo display item (1 aircraft only) while the remainder of the formation re-joins. Up to 3 solo performances with a maximum of 2 figures per performance is allowed. The solo item must re-join the formation as soon as practical and fly within the formation for at least 50% of the overall display.

3.2.5.6 For graphic presentation of aerobatic sequences CIVA allows the use of two different formats: Forms "A", "B" and "C" or Forms "L" and "R". Both Visio-Aresti and OpenAero software systems produce sequence forms in either format. Each judge decides which of both types they want to use. The Chief Judge passes a consolidated decision list on to the Organizer for sorting out the paperwork.

- i. Form "A" is a table showing all figure symbols, catalogue numbers, K-factors and Super Family numbers.
- ii. b) Form "B" is a graphic depiction of the continuous sequence as it would be flown with the wind blowing from right to left, plus a table listing the figures, their catalogue numbers and K-factors.





- iii. Form "C" depicts the continuous sequence as it would be flown with the wind blowing from left to right.
  - iv. Forms "L" and "R" show the sequence diagram and all required data with the wind from either left or right on one sheet each.
- 3.2.5.7 The organisers will be responsible for reproducing a sufficient number of copies of competitors' sequences to meet the contest requirements.
- 3.2.5.8 Signature Programme 2
- 3.2.5.9 In the Signature programme each team is allowed a period of 11m 0s to 12m 0s timed from the moment of smoke ON (with radio call "SMOKE TIMING ON") to the moment of smoke OFF (with radio call "SMOKE TIMING OFF") to show the judges the widest possible range of freestyle formation manoeuvring.
- 3.2.5.10 All flight during this period will be graded by the Judges within the following headings:
- 3.2.5.11 Impact -
- Sequence design and structure
  - Degree of difficulty
  - Smoothness
  - Symmetry
- 3.2.5.12 Formation Changes -
- Number of formation changes
  - Speed of achieving stable result
  - Symmetry of change process
  - Presenting individual changes in their best orientation
- 3.2.5.13 Flight Positioning -
- Symmetry
  - Use of the Performance Zone
- 3.2.5.14 A typical judges' score-sheet for this programme is shown in Appendix A.
- 3.2.6 **Grading of key areas**
- 3.2.6.1 The grading of Impact, Formation Changes and Flight Positioning by each judge for each pilot must be carried out and submitted immediately following each flight, using the range 10 to zero to represent the Judges view of each area of the performance.
- 3.2.6.2 Judges should note that the scoring of this programme is entirely separate from that of Programmes 1 and 2, and may usefully be conducted in a 'relative' manner using the grades awarded to the first competitor as indicators for the grades awarded to later flights.
- 3.2.6.3 Judges should also bear in mind that the grade for the best performance(s) in each area cannot exceed 10, and thus all grades must be set within the range zero to 10.

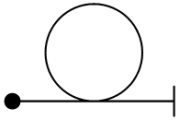
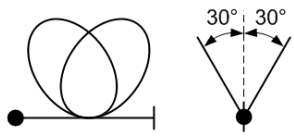
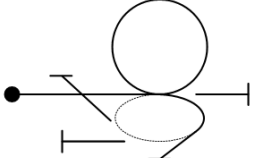
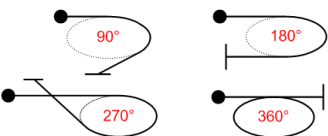
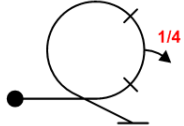
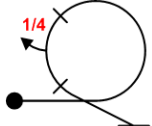


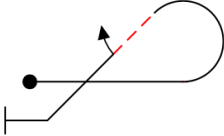
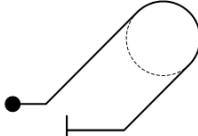
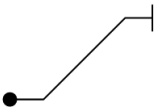
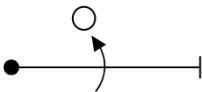
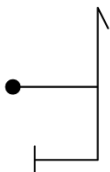
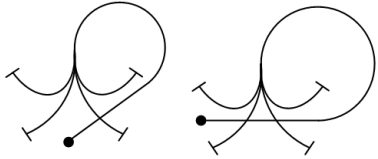
- 3.2.6.4 It follows therefore that the grade awarded to an early performance perceived as excellent in one or more areas should be set with sufficient headroom to allow for an even better later performance to receive a higher grade.

**4 APPENDIX A**

**4.1 Figures for use in WFAC Classic Programme-1 sequences**

- 4.1.1.1 Only the following 12 figure types shall be used in the construction of Classic sequences.
- 4.1.1.2 The 5 figures marked  are mandatory and must be used at least once in the sequence.
- 4.1.1.3 Each sequence must contain a total of 8 figures, excluding manoeuvres added to for the purpose of changing or reversing the axis of flight. Teams must add 3 other figures to the mandatory 5 to make this total, and may optionally repeat figures already used in the 5.

 <p style="text-align: right;">10K</p> <p><u>Loop</u> <input checked="" type="checkbox"/></p> <p>Fly a round loop in the vertical plane with the exit point at the same height and location.</p>	 <p style="text-align: right;">20K</p> <p><u>Butterfly Loop</u> <input checked="" type="checkbox"/></p> <p>Roll 30° and loop on that inclined plane; on completion roll 60° and loop on the opposite inclined plane; on completion roll back to wings level on the original axis.</p>
 <p style="text-align: right;">With 90° turn – 13K 180° turn – 14K 270° turn – 15K 360° turn – 16K</p> <p><u>Loop with Steep Turn</u></p> <p>Fly a standard Loop immediately followed by a standard 90°, 180°, 270° or 360° Steep Turn.</p>	 <p style="text-align: right;">90° turn – 3K 180° turn – 4K 270° turn – 5K 360° turn – 6K</p> <p><u>Steep Turns</u> <input checked="" type="checkbox"/></p> <p>Roll at least 60° without change of heading; immediately pull to turn in horizontal flight through the required angle; on completion maintain heading while rolling back to wings level.</p>
 <p style="text-align: right;">16K</p> <p><u>Quarter Clover Up</u> <input checked="" type="checkbox"/></p> <p>Fly a standard Loop with a quarter roll centered within the first half; the wings must be level when inverted; the exit direction is at 90° to the entry line, at the same height on the other axis.</p>	 <p style="text-align: right;">13K</p> <p><u>Quarter Clover Down</u> <input checked="" type="checkbox"/></p> <p>Fly a standard Loop with a quarter roll centered within the second half; the wings must be level when inverted; the exit direction is at 90° to the entry line, at the same height on the other axis.</p>

 <p style="text-align: right;">16K</p> <p><u>Half Cuban Eight</u> Commence a standard Loop; when past the horizontal/top execute a half roll centred on a 45° downwards plane; the exit line is parallel to the entry, at the same height on the same axis.</p>	 <p style="text-align: right;">8K</p> <p><u>Wing Over</u> Pull to fly a 45° line; roll and pull to horizontal flight with the wings vertical; the second half mirrors the first; the exit line is parallel to the entry line, at the same height on the same axis.</p>
 <p style="text-align: right;">7K</p> <p><u>45° Up Line</u> Pull to 45° and fly the line; push to resume horizontal flight on the same axis.</p>	 <p style="text-align: right;">14K</p> <p><u>Barrel Roll</u> Fly with a constant blend of roll and positive pitch; at the top the axis must be between 60° and 90° to the entry line; the exit path is parallel to the entry, at the same height on the same axis.</p>
 <p style="text-align: right;">17K</p> <p><u>Stall Turn</u> Fly a quarter Loop; continue the vertical line while the speed decays; execute a rudder turn without roll or pitch into a vertical down line; fly a quarter Loop back to horizontal along the entry axis at the entry height.</p>	 <p style="text-align: center;">Do NOT cross the Deadline!</p> <p style="text-align: right;">20K</p> <p><u>Bomb Burst</u> Fly 3/4 of a standard Loop from either axis; when vertical down each aircraft rolls and completes the Loop to exit at equally spaced compass vectors in horizontal flight.</p>

4.1.1.4 Turn-around figures are to “flow” in the sequence and not take excessive time and distance away from the performance zone.

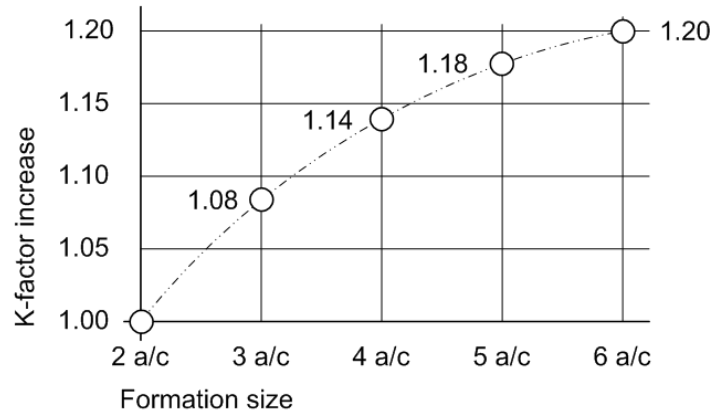
**4.2 Rules for Flat Shows**

4.2.1.1 Teams are to prepare a flat “signature” flight for use when the cloud-base is below 1,500ft and above 800ft. No “Classic” programme scored flights are to take place if the cloud-base is below 1,500ft.

### 4.3 Figure K-factors vs. Formation Size

4.3.1.1 The figure K-factors will be increased from the base data shown above according to the size of the formation:

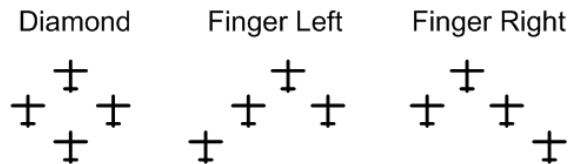
- a) 2 a/c – unchanged
- b) 3 a/c – plus 8%
- c) 4 a/c – plus 14%
- d) 5 a/c – plus 18%
- e) 6 a/c – plus 20%



### 4.4 WFAC Formations

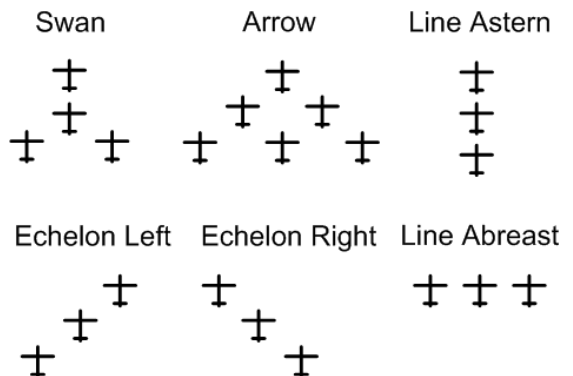
4.4.1.1 The nine formations depicted here will be the standards adopted for all WFAC events.

4.4.1.2 The number of a/c shown in this diagram represents only the formation layout and not the number of a/c that are actually required.



### 4.5 Formation types and figure usage:

- a) Loop: finger, left or right
- b) Butterfly loop: diamond or arrow (6 ship)
- c) 270° turn: Line astern, flat or banked
- d) Formation changes in turn-around figures





#### 4.6 Example Judging Sheets

##### 4.6.1.1 The Classic Judging Sheet

 	<b>WORLD FORMATION AEROBATIC CHALLENGE</b>	<b>Classic</b>
		Team #
		No. in Team

Figure	Symbol	K-factor	Mark	Remarks	Pos.
1					
2					
3					
4					
5					
6					
7					
Position					

Penalties	Remarks	Value	Judge:
Too Low			Number
Time	Mins      Secs		Name
Deadline			Signature
Other			

WFAC Judges Classic Marks Sheet v1



4.6.1.2 The Signature Judging Sheet

 	<b>WORLD FORMATION AEROBATIC CHALLENGE</b>	<b>Signature</b>
		Team #
		No. in Team

No	Area	Description	K-factor	Mark	Remarks	Pos.
1	<b>Flight Impact</b>	Sequence design and structure	40			
2		Degree of difficulty	40			
3		Smoothness	40			
4		Symmetry	40			
5	<b>Formation Changes</b>	Number of formation changes	40			
6		Speed of achieving stable result	40			
7		Symmetry of change process	40			
8		Presenting individual changes in their best orientation	40			
9	<b>Flight Positioning</b>	Symmetry	40			
10		Use of the performance zone	40			

Penalties	Remarks	Value	Judge:
Too Low			Number
Time	Mins      Secs		Name
Deadline			Signature
Other			

WFAC Judges Signature Marks Sheet v1



RECORD OF AMENDMENTS

Version Number	Date Issued
2017 – 1.0	Original