

FAI WORLD GRAND PRIX® SPORTING CODE COMPETITION REGULATIONS - POWERED AEROBATICS

This document online is for information only, it can be modified and cannot be considered as a contract or part of a contract.

Document updated **01 JUN 2008**

TABLE OF CONTENTS

1. INTRODUCTION

- 1.1. THE FAI WORLD GRAND PRIX
- 1.2. COMPETITORS
- 1.3. EVENTS

2. FORMAT

3. FLIGHT PROGRAMMES

4. NOMINATION & ROLE OF THE JUDGES

- 4.1. JUDGES
- 4.2. PUBLIC VOTE

5. COMPETITION REGULATIONS

- 5.1. BRIEFINGS
- 5.2. CANCELLATION
- 5.3. EVALUATION OF THE FLIGHTS
 - 5.3.1. MARKS
 - 5.3.2. SELECTION OF FIGURES
 - 5.3.3. TIME LIMITS
 - 5.3.4. HEIGHT LIMITATIONS
 - 5.3.5. SIGNALLING START & FINISH
 - 5.3.5.1. START & FINISH ANGLE
 - 5.3.5.2. START & FINISH ALTITUDE
 - 5.3.6. SEQUENCE
 - 5.3.7. SMOKE SYSTEM
 - 5.3.8. MUSIC
 - 5.3.8.1. MUSIC-PERFORMING RIGHTS
 - 5.3.8.2. MUSIC-OPERATION
- 5.4. SCORES BY ARTIST JUDGES – 100K
 - 5.4.1. MARKS
 - 5.4.2. CRITERIA FOR EVALUATION OF THE FLIGHTS
- 5.5. SCORES BY TECHNICAL JUDGES
 - 5.5.1. ARTISTIC CREATIVITY (Freestyle) – 400K
 - Technical merit 190K
 - Artistic impression 100K
 - Positioning 110K
 - 5.5.2. RESULTS
 - 5.5.3. COLLECTION OF SCORING SHEETS
 - 5.5.4. PUBLIC ANNOUNCEMENTS
 - 5.5.5. FINAL RESULTS - POINTS
 - 5.5.6. DEAD HEAT

1. INTRODUCTION

1.1. The FAI World Grand Prix

The main purpose of the FAI World Grand Prix is to promote and develop Air Sports through an official International competition of the FAI to be held in the frame of an air show-type entertainment programme. It is also a safety tool for air show organisers.

The FAI World Grand Prix is open to Aerobatic solo pilots and formation teams, private or national (civilian or military), flying any type of aircraft, with propeller-driven or jet engines.

It consists of the FAI World Grand Prix competitions (Events) which are included in the FAI calendar and in respect of which Promoters have signed the organisation agreement.

1.2. Competitors

Competitors can be civilian or military, solo pilots or formation teams, holding an Haute Voltige Display Authorisation. Solo pilots with propeller-driven aerobatic aircraft must be members of their national aerobatic team at Unlimited level. The Haute Voltige director has the power to eventually extend invitations to former members whose participation in an Unlimited World Aerobatic Championship is not more than ten (10) years.

Military and Test pilots will be selected by their own Staff.

Pilots can be excluded for misconduct when their attitude is judged damageable or hostile to the interests of the FAI World Grand Prix.

1.3. Events

- a. The FAI World Grand Prix will consist of one, or a series of Events, to be held as announced every year in the FAI Calendar of Events. Each Event will have the status of a World Championship competition (Category One).
- b. Events are opened to solo and formation team aerobatic flights in the following Categories:
 - Propeller aircraft without any limitation (Piston Engines and Turboprops), single and two-seaters.
 - Jet aircraft, single and two-seaters.
- c. For formations and solo pilots, the distinction is made between propellers (piston and turboprop) and jets, not between single and two-seaters.
- d. There is no distinction between male and female classes.
- e. It is not compulsory for all categories to be displayed at each Event.

2. FORMAT

2.1. Depending on the number of competitors and programmes to be flown, each public Event will last between:

- A minimum of ninety (90) minutes
- A maximum of 3 days (one practice day and two competition days).
- The final result of each contest will be obtained by considering the best result scored by each competitor in all their competition flights completed.

2.2. Each competitor may officially fly up to five (5) times on site:

- One check flight after aircraft reassembly, when applicable;
- One practice flight (20 to 30 minutes per team, 10 minutes per solo pilot);
- One qualification flight to determine the flight order for the competition (= reverse order of the results). If not possible, then a drawing lots procedure will be applied.
- Two competition flights (Artistic Creativity - Freestyle to music, duration as per 5.3.3);

All other practice flights will depend on time slots allocated by the organiser.

2.3. A minimum of 2 competitors is required for having a competition.

3. FLIGHT PROGRAMMES

Competitors will perform only the following Programme for which they have been trained:
Artistic Creativity, "freestyle" to music, duration as per 5.3.3

4. NOMINATION & ROLES OF JUDGES

4.1. Judges

Depending upon each Event, there may be up to three (3) sets of Judges:

- A. Three (3) International Technical Judges for each category, selected by the FWGP-CC (Coordinating Committee Haute Voltige / FAI);
- B. Three (3) Artist Judges, selected by the Organiser for judging the artistic aspect of the flights;
- C. Public Vote

A and B are the Expert Judges who will determine the official and final ranking.

C will designate the winner of the public vote. Until further notice, the results of the public vote will be independent from the results of the Expert Judges.

The International Jury will consist of the Contest Director and Chief Judge.

4.1.1. Technical Judges

Formation Teams and Jets - The international technical judging panel of three (3), will be selected amongst former National Formation Team members.

Solos pilots - The International judging panel will comprise of one (1) Chief Judge and two (2) International Judges. The international panel of three (3) Judges will be selected amongst FAI judges listed in the FAI official document to that effect.

4.1.1.1. Chief Judge

Safety will at all times be the primary consideration of the Chief Judge. The Chief Judge shall be selected and appointed by the FWGP-CC for all categories.

- A specialist in each category may assist the Chief Judge.
- The main concern of the Chief Judge should be the accurate and fair judging of the competition flights, including the monitoring of flights for penalties. He should place his expertise at the disposal of the Board of Judges, and co-ordinate and guide their work.
- The Chief Judge should hand raw results right after each flight, so the public can be informed as soon as possible of who is in the lead. The ranking of National Teams should not be made public, except for the team in 1st position.
- The Chief Judge shall give marks like any of the other Judges. The official recording of penalties will be on a separate sheet, which is later available for the contestant to check.
- The awarding of penalties, or disqualification for infringement of the Display Line, must be a unanimous decision (3 votes) of the technical judging panel (including the Chief Judge) in the absence of special measuring devices.
- He certifies the scores.
- He advises the Technical Commission, Medical and Safety Committee when required.
- He deals with protests from competitors.
- He oversees the administration of the contest.
- He checks the duration of flight.
- He reports the Judges decision concerning penalties immediately after landing.

4.1.1.2. International Judges

For marking the quality of aerobatic manoeuvres.

- They will mark the programmes and infringements of the Display line in compliance with the rules.
- They will also check the duration of flight and give penalty points when applicable.
- They will record low infringement.

4.1.1.3. Jury

4.1.1.3.1.

- The Jury will be nominated for all categories.
- Any decision taken by the Jury is final.
- The Jury is not authorised to change any rule that has been approved.

4.1.1.3.2. The Jury is the supreme arbitration body and shall be responsible for:

- Interpreting the Judging Rules and the General Regulations of the contest.
- Supervising the activities of the Board of Judges.
- Supervising the Technical Commission, Medical and Safety Committee when required.
- Dealing with protests from competitors. The Jury must be available to hear appeals or protests submitted by competitors.
- Overseeing the administration of the contest.
- Reporting the Judges decision concerning penalties immediately after landing.

4.1.1.4. Deadline (Display Line) Judges

The infringement of the Display Line will cause disqualification of the competitor.

When required, the Chief Judge may select deadline judges on site should no electronic devices be available to confirm any infringement.

Should no electronic devices be available, disqualification will be confirmed when three (3) Technical Judges (including the Chief Judge) report the infringement, in addition to the deadline Judges (if any).

4.1.1.5. Position of the Judges

The Judges will be posted by the Chief Judge at positions decided during the briefing before training flight with Pilots and Judges.

4.2. Public Vote

The public audience may be invited to vote by any means agreed by Haute Voltige and to be put in place by the Promoter. The Public Vote ranking will be separated from the ranking made by Expert Judges. Only the winners will be announced.

5. COMPETITION FLIGHTS REGULATIONS

5.1. Briefings

Prior to the start of a contest a briefing will be made by the Flight Director, Contest Director and Chief Judge to all competitors and officials on flight conditions, contest programmes, and any other problems which might arise over the interpretation of the rules.

5.1.1. Pilots Briefing

- Prior to the start of the first Practice flight a briefing will be made to Competitors on local procedures.
- Before the beginning of each flying day, a briefing will be held for Competitors, Officials, Judges, and the International Jury on organisational matters concerning this day.

The briefings shall include, as a minimum:

- Weather forecast and winds aloft.
- Description of the performance Zone and the Judges position.
- Safety and Security rules, deadline and minimum altitude if any.
- Starting procedure.
- Music procedure.
- Determining the flight order (with necessary adjustments to accommodate Pilots sharing the same aircraft).
- Emergency procedures.

The Pilots briefing is compulsory. No Briefing = NO FLIGHT.

5.1.2. Judges Briefing

This briefing is compulsory for all Expert Judges. It will be conducted by the Chief Judge and shall include:

- Deadline Judges duties (if any).
- Judges review of the following items:
 - Range of scores
 - Criteria for scoring.
 - Other items deemed necessary.
- Emergency procedures.

5.2. Cancellation

- If one Competitor cannot fly because of technical trouble with his/her aircraft, the Competitor will be withdrawn and the competition will be validated.
- The Contest Director can stop the competition at any time when required.

5.3. Evaluation of the Flights

5.3.1. Marks

Marks are assigned by Technical judges with numbers from 0 to 10 accurate to 0.5. The score is calculated by multiplying the judges' marks by the coefficients (K factors) of the different criteria and adding the products.

5.3.2. Selection of Figures

Selection of figures, or figure combinations, in the freestyle programmes will be made by each Competitor.

5.3.3. Time Limits

- The "Artistic Creativity" programme (Freestyle to Music) has to be performed between time limits depending on the number of pilots composing each Formation Team.
 - Formation team of 2 or 3 pilots = 10 minutes, plus or minus 30 seconds.
 - Formation team of 4 pilots = 11 minutes, plus or minus 1 minute.
 - Formation team of 5 or 6 pilots = 14 minutes, plus or minus 2 minutes.
 - Formation team of 7 or 8 pilots = 16 minutes, plus or minus 2 minutes.
 - Formation team of 9 or 10 pilots = 18 minutes, plus or minus 2 minutes.

- For solo pilots, the "Artistic Creativity" programme (Freestyle to Music) has to be performed between 3min30 and 4 minutes.
All times mentioned are "display times", from the opening figure of the performance to the closing figure.
- Any deviation of time under the minimum or over the maximum will incur 10 (ten) penalty points for each further second or each further fractional part of a second, with a maximum of 150 penalty points (reduced from the total score given by the 3 Technical Judges).

5.3.4. Height limitations

The lower limit shall be determined by the local regulations. A penalty of 250 points for each infringement will be deducted from the total score given by the 3 Technical Judges, each infringement to be unanimously agreed.

The disqualification height shall be half the lower limit. Disqualification must be applied by the 3 Judges. Height limitations are not applicable after the end of the sequence (noted by radio). Low passes are permitted according to the briefing.

5.3.5. Signalling Start and Finish

- Formation teams and solo jet pilots will signal their start and finish by radio: "Call sign display start...TOP" and "Call sign display finish...TOP".
- A Solo prop-aircraft competitor must signal the start and finish of the program by distinctly dipping the wings 3 times immediately one after the other by more than 45°. For timing purposes the program is deemed to start on the return of the wings to level after the 3rd wing dip, and is deemed to finish on their return to level after the first of the final wing dips.
- If start / finish is not signalled, a penalty of 150 points (deducted from the total score given by the 3 validated judges) will be applied.

5.3.5.1. Start and Finish - angle

The start and finish of the program may be in normal or inverted flight on a horizontal, ascending or descending path, which must not deviate from the horizontal by more than 45°.

5.3.5.2. Start and Finish - altitude

Competitors may start or finish their program at any height between the minimum height above airfield level and the maximum altitude allowed by the Airspace waiver, within the limits of the Performance Zone.

5.3.6. Sequence

Forms containing the sequence of figures will have to be submitted to the Contest Director when requested, to be provided to the National Aviation Authorities. They will be kept secret from the other Competitors and from the Judges.

5.3.7. Smoke System

All aircraft have to be equipped with a smoke system. Smoke will be used at the option and under the responsibility of each Competitor.

5.3.8. Music

5.3.8.1. Music – Performing Rights

Each competitor will select the music for its own flights and will undertake all responsibility with regards to obtaining the permission from composers to use their music for public displays.

Each Promoter will undertake all responsibility in regards to the performing rights (broadcast) for recorded music, including declaration to an appropriate Company in charge of collecting authors rights in the Event country.

5.3.8.2. Music - Operation

CD/MD

Competitors are required to supply their musical accompaniment on one MD track or a CD for the "Freestyle to Music" programme. The music will be played by an operator of the team, or by a local operator who will just broadcast the recording as it is, no action will be made by the local operator (fade out, change tracks, etc...)

Music in the Cockpit

- When required, the Pilots will be provided with the capability of hearing the music whilst flying.
- Combination with an announcer is possible but comments should not be heard by the pilots.
- Until direct command of the music from the pilot's cockpit becomes possible, the following procedure should be applied.

Music - Radio Procedure

- After a radio check (procedure = "Radio check" on the music frequency), music will begin on the word "GO" upon the instructions of the Pilot by radio (procedure = "Music READY ... Music GO!" on the appropriate VHF frequency) to the operator of the music system.
- The Chief Judge must monitor the VHF frequency to check the duration of flight.
- Judges must be in the position to hear the music and comments, through speakers (monitors).

Music - Failure

- If the music does not start because of a technical problem linked to the sound system itself, the sequence may be aborted by the Pilot after he has made the announcement by radio to the Contest Director.
- The Competitor will be entitled by the Chief Judge to fly again.

5.4. Scores by Artist Judges

5.4.1. Marks

Artist Judges will express their opinion by a mark out of 10. A coefficient K=100 will be applied, scores (maximum 1000 points per artist judge per pilot).

The final scores of the Artistic Judges are to be added to the final scores of the 3 Technical Judges.

It means a competitor can be allocated a maximum of 3'000 points by 3 Artist Judges, and 12'000 points by 3 Technical Judges (see below), therefore a maximum total of 15'000 points.

5.4.2. Criteria for evaluation of the flights

In the case of Aerobatics, an artistic evaluation is totally subjective. Technical judges have a range of criteria at their disposal to assist them as they may not have artistic skills, but Artist Judges simply have to create their own scale of judgment to express their deep feeling, like as a reader in front of a piece of poetry. As a spectator watching something they may not understand, ephemeral figures that can create an emotion, even goose pumps of total pleasure when the combination of flying and music seems to reach perfection.

5.5. Scores by Technical Judges

Technical Judges: Total K = 400 per programme flown. It means that the maximum score possible is 4000 points per Technical Judge/per pilot.

- The maximum total score will be 12000 points per pilot per programme (in addition to the scores of the Artist Judges if any). To this total score, penalties are withdrawn.
- The total number of points will be brought back to 100, which will give the percentage of perfection reached by the Competitor.

5.5.1. Artistic Creativity (Freestyle)

All Freestyle Programmes will be marked under 3 different headings:

- (1) Technical Merit
- (2) Artistic Impression
- (3) Positioning

(1) Technical Merit = 190K

(1) A. Formation Teams

Close formation (positive and inverted), **symmetry, constant distance between aircraft, parallax correction = 60K** (25K for positive figures and 35K for negative figures).

Formation changes during vertical and turning figures = 40K

Higher marks should be given to formation changes which are neat and clearly visible to the public, not hidden behind a curtain of smoke.

Precision of the execution = 50K

It should be clear to the judges that the manoeuvres flown were, in fact, intended and fully under the pilot's control. Higher marks will be given under this heading when individual elements are started and finished on obviously precise headings and well-defined attitudes (individual rolls for example), and when group manoeuvres are performed as if it was only one aircraft. When, for example, manoeuvres are allowed to decay into imprecise, poorly defined formation changes, judges should consider deducting marks for poor execution. Marks should also be deducted if it appears that the pilot has relinquished control of the aircraft for short periods.

Versatility: combination of a wide variety of figures flown on different axes & flight paths = 40K

Many different figures should be completed in the time available. These should include manoeuvre elements of many different kinds and should use many different flight paths and axes. Lower marks should be given to a pilot who used only one or two principal axes of flight. However the use of additional axes must be clear and precise, not giving the appearance of being used by chance. Marks should also be deducted if any particular manoeuvre element is over-used or continues for an excessive period of time.

(1) B. Solo Jets and Props

Use of the full range of the flight envelope = 50K

The pilot is expected to make full use of many different areas of the flight envelope of the aircraft. This means flying at the full range of air speeds and accelerations permitted. The time available should be divided between high speed, high G manoeuvres and slower flight periods. Both positive and negative parts of the envelope should be used, in reference to both speed and G. The flight should include the demonstration of controlled flight beyond the stall boundary by use of auto-rotation or other high-alpha manoeuvres.

The judge will deduct points if any of these areas are noticeably under-utilised.

Exploitation of aerodynamic controls & gyroscopic forces:

The pilot is expected to show movement of the aircraft about all axes. Higher marks will be given to pilots able to make use of all these effects through a wide range of aircraft attitudes and flight paths. Repeated use of the same or similar attitudes should attract lower scores.

Precision of the execution = 60K

It should be clear to the judges that the manoeuvres flown were, in fact, intended and fully under the pilot's control. Higher marks will be given under this heading when individual manoeuvre elements are started and finished on obviously precise headings and well-defined attitudes. When, for example, manoeuvres are allowed to decay into imprecise, poorly defined auto-rotation, judges should consider deducting marks for poor execution. Marks should also be deducted if it appears that the pilot has relinquished control of the aircraft for short periods.

Versatility: combination of a wide variety of figures flown on different axes & flight paths = 80K

Many different figures should be completed in the time available. These should include manoeuvre elements of many different kinds and should use many different flight paths and axes. Lower marks should be given to a pilot who used only one or two principal axes of flight. However, the use of additional axes must be clear and precise, not giving the appearance of being used by chance. Marks should also be deducted if any particular manoeuvre element is over-used or continues for an excessive period of time.

(2) Artistic Impression = 100K

(2) A. Formation Teams and Solo Jets

The difficulty of the Grand Prix is for pilots to fly perfectly in harmony and rhythm with a musical arrangement they have selected themselves. Marks should be deducted in this category for a flight that shows no relation between the rhythm of the evolutions and the music, therefore transforming the musical accompaniment to simple background music.

However, it is also difficult to combine for formation teams with a large number of pilots who cannot listen to the music for safety reasons and need to broadcast a public commentary. It is also difficult for solo jets which can be very noisy and destroy the interest of a musical accompaniment, but can play with the "guts" of the audience. Therefore, a compromise has been decided and use of the following criteria will be applied by Judges:

Audio 35K

- Synchronisation with musical accompaniment = 30K
- Commentary, sound effects = 5 K

Visual effects 10K

- Appropriate use of smoke systems
Smoke systems are used at pilot's discretion to underline figures and offer them additional value, not to create a permanent fog around the aircraft. It is an art to define when to use smoke and when it is not appropriate.
- Use of special effects (flares, fireworks, etc..)

Creative emotion 30K

Feeling, goose bumps effect, entertainment value.

Presence 25 K

It is the "sky occupation", the absence of gaps with no aircraft flying in front of the public.

(2) B. Solo Props

Synchronisation with musical accompaniment = 70K

The difficulty of the Grand Prix is for pilots to fly perfectly in harmony and rhythm with a musical arrangement they have selected themselves. Marks should be deducted in this category for a flight that shows no relation between the rhythm of the evolutions and the music, therefore transforming the musical accompaniment to simple background music.

Appropriate use of smoke systems = 5 K

Smoke systems are used at pilot's discretion to underline figures and offer them additional value, not to create a permanent fog around the aircraft. It is an art to define when to use smoke and when it is not appropriate.

Creative emotion = 25K

Feeling, goose bumps effect, entertainment value.

(3) Positioning = 110K

(3) A. Formation Teams

Synchronisation between different elements of the formation team (between synchro-pair and main formation, crossings of the synchro pair, splits and join-ups) = **30K**

The sequence should be centred on the judges position and flown within the performance zone = 40K

Highest marks will be given when the sequence as a whole is balanced evenly to the left and right of the judges' direct line of vision towards the centre of the performance zone. Marks should be deducted if, by design or by influence of the wind, a pilot's programme is noticeably biased to left or right. The greater the degree of asymmetry, the greater should be the deduction.

Even though a flight might be symmetrical, it may also spread too far to either side, so that some manoeuvre elements are flown outside the performance zone. Figures may also be flown on the direct line of vision but very distant. Any part of the flight that is flown so far away that it appears to be outside the zone should be penalised at a rate of 0.5 of a mark for each apparent excursion.

Presenting figures in their best orientation = 40K

Figures can give different impressions when seen from different viewpoints. Each figure has an optimum position from which it should be viewed. For example, a figure flown near the upper height limit will cause discomfort when flown at the near edge of the performance zone; a low level horizontal figure is better seen from close than far away. Marks should therefore be deducted if the judge is not shown a figure in its best orientation and optimum position.

(3) B. Solo Jets and Props

Symmetry - The sequence should be centered on the judges position and flown within the performance zone = 50K

Highest marks will be given when the sequence as a whole is balanced evenly to the left and right of the judges' direct line of vision towards the centre of the performance zone. Marks should be deducted if, by design or by influence of the wind, a pilot's programme is noticeably biased to left or right. The greater the degree of asymmetry, the greater should be the deduction.

Even though a flight might be symmetrical, it may also spread too far to either side, so that some manoeuvre elements are flown outside the performance zone. Figures may also be flown on the direct line of vision but very distant. Any part of the flight that is flown so far away that it appears to be outside the zone should be penalized at a rate of 0.5 of a mark for each apparent excursion.

Presenting individual figures in their best orientation and their optimum position depending on the sun = 60K

Figures can give different impressions when seen from different viewpoints. For example, a climbing inverted flat spin (eventail) looks most impressive when the top of the aircraft can be seen. A loop flown in a plane inclined at 45 degrees to the vertical is best appreciated when it is flown on the Y-axis.

Each figure has an optimum position from which it should be viewed. For example, a figure flown near the upper height limit will cause discomfort when flown at the near edge of the performance zone; a low level horizontal figure is better seen from close than far away.

Marks should therefore be deducted if the judge is not shown a figure in its best orientation and optimum position depending on the sun.

5.5.2. Results

The result per programme is obtained by adding up the scores of each heading.

The winner of each Event in each Category will be the best score of all competition programmes flown, after deduction of eventual penalties. It means that, if there are two competition flights, only the best one will be taken into account. And if a competitor can fly only once, then only this flight will be considered.

5.5.3. Collection of Scoring Sheets

The total results shall be available to the Competitors.

Except for National Teams, the current "raw results" of each flight will be announced and published on a score board to indicate the Competitors placing. If penalties have to be applied later on, then the standings can be modified at the end of the competition flights of the day.

The final evaluation and placing will be officially announced after checking by the FWGP Director.

5.5.4. Public Announcements

Prior to and after the performance of a program, details regarding the Competitor concerned should be published by any means (radio, announcer, etc...).

During the performance only music or a live commentary should be heard, explaining the figures or technical details but without any comment on the quality of the flights for keeping public interest alive.

All public commentaries shall not be heard by the Pilots whilst flying.

For National Teams and military / test pilots participants, only the top competitor will be officially and publicly announced.

5.5.5. Final Awards

Trophies and/or FAI medals will be awarded at each contest to the winners in each category: Gold, Silver and Bronze medals to competitors ranked 1st, 2nd and 3rd, respectively.

5.5.6. Dead Heat

- If two competitors finish the event with the same number of points, the higher place in the competition shall be awarded to the holder of the best other flight.
- If this procedure fails to produce a result, Prizes awarded for all the positions of competitors who tie, will be added together and shared equally.