



# FAI Sporting Code

*Fédération  
Aéronautique  
Internationale*

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## Section 4 – Aeromodelling

# Volume F6 Airsports Promotion Classes

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- F6A – AIRPLANE ARTISTIC AEROBATICS
- F6B P – AEROMUSICALS
- F6C – HELICOPTER ARTISTIC AEROBATICS
- F6D – HAND THROWN GLIDERS

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<sup>1</sup> FAI Statutes, Chapter 1, para. 1.6

<sup>2</sup> FAI Sporting Code, General Section, Chapter 3, para 3.1.3.

<sup>3</sup> FAI Statutes, Chapter 1, para 1.8.1

<sup>4</sup> FAI Statutes, Chapter 5, para 5.1.1.2; 5.5; 5.6 and 5.6.1.6

<sup>5</sup> FAI Bylaws, Chapter 1, para 1.2.1

<sup>6</sup> FAI Statutes, Chapter 2, para 2.3.2.2.5,

<sup>7</sup> FAI Bylaws, Chapter 1, para 1.2.3

<sup>8</sup> FAI Statutes, Chapter 5, para 5.1.1.2; 5.5; 5.6, 5.6.1.6

<sup>9</sup> FAI Sporting Code, General Section, Chapter 3, para 3.1.7

<sup>10</sup> FAI Sporting Code, General Section, Chapter 1, paras 1.2. and 1.4

<sup>11</sup> FAI Statutes, Chapter 5, para 5.6.3

<sup>12</sup> FAI Bylaws, Chapter 1, para 1.2.2

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## **VOLUME F6**

### **SECTION 4C – MODEL AIRCRAFT – F6 – AIRSPORTS PROMOTION CLASSES**

- 6.1 Class F6A – Airplane Artistic Aerobatics
- 6.2 Class F6B – AeroMusicals
- 6.3 Class F6C – Helicopter Artistic Aerobatics
- 6.4 Class F6D – Hand Thrown Gliders



## VOLUME F6

### RADIO CONTROL FREESTYLE AEROBATICS TO MUSIC

#### 6.1. CLASS F6A – AIRPLANE ARTISTIC AEROBATICS

##### 6.1.1 Definitions of an Artistic Aerobatics Airplane

A model aircraft, but not a helicopter, that is aerodynamically manoeuvred by control surface(s) in attitude, direction and altitude by a pilot on the ground using radio control.

##### 6.1.2 General characteristics of Radio Controlled Artistic Aerobatics Airplanes:

Maximum overall span: ..... 2 m

Maximum overall length: ..... 2 m

Maximum total weight: ..... 5 kg without fuel

Power source limitations: any suitable power source may be utilised except those requiring solid propellants, gaseous or liquefied gaseous fuels. Electric powered aircraft are limited to a maximum of 42 Volts for the propulsion circuit.

Paragraph B.3.1 of Section 4b (Builder of Model) is not applicable to class F6A.

The maximum permitted noise level will be 92 dB(A) measured at 3 m from the centre line of the aircraft with the aircraft placed on the ground over concrete or macadam at the flying site. With the motor running at full power, measurements will be taken 90 degrees from the flight path on the right hand side and downwind from the aircraft. The microphone will be placed on a stand 30 cm above the ground in line with the motor. No noise reflecting objects shall be nearer than 3 m from the aircraft or microphone.

The measurement will be made at the conclusion of any preliminary flight when, in the opinion of any one judge, the Field Marshall, the Contest Director or the FAI Jury, the aircraft is deemed too noisy, but at least 20% of the entrants must be checked. If a concrete or macadam surface is not available then the measurement may be taken over bare earth or very short grass, in which case the maximum noise level will be 90 dB(A).

In the event an aircraft fails the noise test, no modification or adjustment to the aircraft shall be permitted (other than refuelling) and the aircraft shall be re-tested by a second noise steward using a second noise meter. In the event that the aircraft fails the re-test, the score for the preceding flight shall be zero. If this noise check was made at the conclusion of the first preliminary flight, another noise check shall be made at the conclusion of the second preliminary flight.

The measuring equipment must be calibrated to the dB(A) sound pressure level scale defined in applicable ISO Standards. If the noise measurement criteria cannot be met, the measurements will be advisory only and no competitor can be excluded from the competition.

Radio equipment shall be of the open loop type (i.e. no electronic feedback from the aircraft to the ground). Auto-pilot control utilising inertia, gravity or any type of terrestrial reference is prohibited. Automatic control sequencing (pre-programming) or automatic control timing devices are prohibited.

Example:

Permitted:

- Control rate devices that are manually switched by the pilot.
- Any type of button or lever control that is initiated and terminated by the pilot.
- Manually operated switches to couple control functions.

Not permitted:

- Snap buttons with automatic timing mode.
- Pre-programming devices to automatically perform a series of commands.
- Auto-pilots for automatic wing levelling.
- Propeller pitch change with automatic timing mode.
- Any type of voice recognition system.
- Any type of learning function involving manoeuvre to manoeuvre or flight to flight analysis.

### **6.1.3. Definition and Number of Helpers**

A helper may be a Team Manager, another competitor or an officially registered helper. Each pilot is permitted one helper during the flight. Two helpers may be present during the starting of the motor(s). The second helper may place the aircraft for take-off and retrieve the aircraft following the landing.

### **6.1.4. Number of flights**

- 6.1.4.1. The competition consists of one or several qualifying rounds leading to a final round. A semi-finals round may be added at National, International competitions and World Air Games, but not at local or regional competitions. Preliminary round(s) are organised to establish the starting order for the first qualifying round. Organisers may elect to choose other methods resulting in a similar starting order.
- 6.1.4.2. A preliminary flight round consists of one flight for each competitor. A qualification, semi-finals or finals round consists of one Music Compulsory and one Music Free Style flights for each competitor.
- 6.1.4.3. All competitors have the right to an equal number of preliminary rounds. Only completed rounds will be taken into account.
- 6.1.4.4. All pilots are entitled to fly the first qualifying round. If there is a second qualification round, it will be open to no more than the top 80 % competitors. The number of competitors accessing the second round shall be determined by the Organiser before the beginning of the competition, and preferably in the preliminary competition information bulletin, according to the number of competitors and the time available. If more than two qualification rounds are flow, the Organiser shall similarly decrease the number of pilots accessing any subsequent round.
- 6.1.4.5. If there is a semi-final round, it shall be open to no more than the top 20 or 50 % remaining competitors, whatever is the smallest. The number of competitors accessing the semi-final round shall be determined by the Organiser before the beginning of the competition, and preferably in the preliminary competition information bulletin, according to the number of competitors and the time available.
- 6.1.4.6. The final round shall be open to no more than the top 10 or 50 % remaining competitors, whatever is the smallest, but at least 5. The number of competitors accessing the final round shall be determined by the Organiser before the beginning of the competition, and preferably in the preliminary competition information bulletin, according to the number of competitors and the time available.
- 6.1.4.7. At the discretion of the Organiser and provided this is specified in the competition preliminary information, the competitors not qualified for a further round may be allowed to participate in further, separate, consolation rounds. Such rounds shall follow the same principle as the main competition rounds and the Organiser may choose how the competitors will be allowed access to the consolation rounds. However, the main competition shall always have precedence if the time available does not allow all scheduled flights to take place and for the use of the best time frame for spectators and media.

6.1.4.8 At the end of the competition, competitors taking part in consolation rounds shall be ranked immediately after the last competitor qualified at the end of the first qualification round.

#### 6.1.5. **Definition of an attempt**

There is an attempt when the competitor is given permission to start.

**Note:** If the competitor fails to take off within the three minutes allowed, he must immediately make room for the next competitor. If the motor stops after the take-off has begun, but before the aircraft is airborne, it may be restarted within the 3-minute starting period.

#### 6.1.6. **Number of attempts**

Each competitor is entitled one attempt for each official flight

**Note:** An attempt can be repeated at the contest director's discretion only when, for any unforeseen reason outside the control of the competitor, the aircraft fails to start (e.g. there is radio interference). Similarly, in a flight that is interrupted by any circumstance beyond the control of the competitor (e.g. sudden rainfall, music airing malfunction, etc.) , the competitor is entitled a re-fly. During the preliminary rounds, only the manoeuvre affected and the un-scored manoeuvres that follow will be judged. During the subsequent rounds, the whole flight shall be re-flown and scored as a whole.

#### 6.1.7. **Definition of an official flight**

There is an official flight when an attempt is made, whatever the result.

#### 6.1.8. **Marking**

##### 6.1.8.1. **Judges**

All flights shall be judged by a panel of at least 3, and preferably 5, judges. The scores of all judges shall be taken into account.

##### 6.1.8.1.1. **Preliminary rounds**

Each manoeuvre may be awarded marks, in half point increments, between 10 and 0 by each of the judges during the flight. These marks are multiplied by a coefficient, which varies with the difficulty of the manoeuvre, according to the current Aresti Aerobatic Catalogue. The manoeuvre sequence is established by the ad hoc sub-committee on a yearly basis and accepted by the CIAM Plenary Meeting for application during the following year.

Any manoeuvre not completed shall be scored zero (0). Manoeuvres must be performed where they can be clearly seen by the judges. If a judge, for some reason outside the control of the competitor, is not able to follow the aircraft through the entire manoeuvre, he may set the "Not Observed" (N.O.) mark. In this case, the judges' mark for that particular manoeuvre will only take into account the other judges' marks. Centre manoeuvres should be performed in the centre of the manoeuvring area while turn around manoeuvres should not extend past a line 60° left and right of centre. Vertical height, as seen from the judges' location, should not exceed 60°. Also, manoeuvres should be performed along a line of flight not more than 150 m in front of the pilot. Infractions of this rule will be cause for downgrading by each judge individually and in proportion to the degree of infraction. The manoeuvring area will be clearly marked with white vertical poles (or a colour contrasting with the surrounding colours), a minimum of 100 mm in diameter and a minimum of 4 m high, placed on centre and 60° each of centre on a line 150 m in front of the pilot. Flags and/or streamers of contrasting colour should be mounted on the poles to improve visibility.. White (or contrasting) lines, originating at the pilot's position and extending outward at least 50 m will also be used to mark the centre and extreme limits (60 degrees left and right of centre) of the manoeuvring zone. Audible and visual signals to indicate violations of the manoeuvring zone are not to be employed.

The judges shall be seated not more than 10 m behind the pilot's position (the apex of the 60-degree lines) and within an area described by the extension of the 60 degree line to the rear of the pilot.

If an aircraft is, in the opinion of the judges or the Contest Director, unsafe or being flown in an unsafe manner, they may instruct the pilot to land. In this case, the flight will be deemed complete.

The raw score given by each judge for each competitor shall be made public immediately at the end of each preliminary flight.

#### 6.1.8.1.2. Qualification, semi-finals and finals flights

Each flight may be awarded marks, in half point increments, between 10 and 0 by each of the judges and for each judging criterion. Judging shall be done on:

- Technique (difficulty and precision of the individual manoeuvres) ;
- Artistic quality (originality, harmony & rhythm, composition and versatility of the entire flight sequence, adhesion to the music) ;
- Overall appearance (use of the flight space, positioning of the manoeuvres and general impression).

Thus each judge may award a maximum of 30 points to each competitor.

#### 6.1.9. Classification

- 6.1.9.1. Unless stated otherwise in the Competition announcement, each competitor will have the right to two preliminary flights, the best one determines the preliminary ranking.
- 6.1.9.2. All competitors are entitled to compete in the first qualification round. The starting order is established according to the reverse preliminary ranking, i.e. the competitor ranked last in the preliminaries start first in both flights of the first qualification round and the competitor ranked first starts last. If no Preliminary rounds are flown, the starting order shall achieve the same aim.

For each flight, all scores will be normalised to 1000 points as described below:

$$\text{Points}_x = \frac{S_x}{S_w} \times 1000$$

Points<sub>x</sub> = point awarded to competitor X

S<sub>x</sub> = score of competitor X

S<sub>w</sub> = score of winner of the flight

- 6.1.9.3 The score at the conclusion of the preliminary rounds is the score of the best preliminary flight.
- 6.1.9.4. The score of a qualification, semi-final or final round is the sum of the two flight scores of that round.
- 6.1.9.5. The intermediate score at any stage of the competition is the sum of all complete qualification and semi-final flight(s).
- 6.1.9.6. The flight starting order at the beginning of any round after the preliminary round(s) is in reverse order of the intermediate classification at the end of the preceding round.
- 6.1.9.7. The final score is the sum of all complete qualification, semi-final and final rounds.
- 6.1.9.8. Provided this is specified in the competition announcement, the Organiser may elect to organise Airplane and Helicopter Artistic Aerobatics as a single competition with a common classification.

#### 6.1.10. Tasks

##### 6.1.10.1. Preliminary rounds

During the preliminary rounds the competitors must fly a compulsory sequence of aerobatics manoeuvres judged for smoothness and precision.

Individual manoeuvres shall be taken from the FAI Aerobatic Catalogue ; all manoeuvres difficulty coefficients and pertinent rules (including judging rules) shall apply.

The manoeuvres sequence shall be prepared in such a way that manoeuvres are of essentially increasing difficulty. The sequence shall be composed so as to enable completion of the judged part of the flight in approximately 120 seconds.

There shall be no time limit for completing a flight, except that the competitor must begin the compulsory sequence within 30 seconds from the moment the aircraft begins its take-off roll and landing touch down must occur within 30 seconds after the last manoeuvre in the sequence has been completed.

Scoring shall be done using the Tarassov-Bauer-Long (TBL) system or a derivative of such system, as approved by the CIAM, or any other system approved by the CIAM.

#### **6.1.10.2. Music compulsory flights**

These are flights where each competitor must compose his own sequence of manoeuvres to suit a compulsory music. Any manoeuvre may be flown, provided safety is ensured. Unsafe flying, in the opinion of the judges, shall result in a zero score.

The flights shall be judged for technique (precision and difficulty of the individual manoeuvres), artistic quality (composition of the complete sequence, variety of the manoeuvres, rhythm and adherence to the music) and overall appearance. Excessive noise deters from the overall appearance and shall accordingly induce downgrading. A judging guide shall define the judging criteria and their relative weights.

The music to be used will be chosen and prepared by the ad hoc sub-committee on an annual basis and adopted by the CIAM Plenary meeting for application during the following year.

For qualification flights, the duration of the compulsory music shall be between 100 and 140 seconds.

For semi-finals, when applicable, the duration of the compulsory music shall be between 150 and 210 seconds.

For finals, the duration of the compulsory music shall be between 220 and 260 seconds.

#### **6.1.10.3. Music free-style flights**

These are flights where each competitor must compose his own sequence of manoeuvres to suit a music of his own choice. Any manoeuvre can be flown, provided safety is ensured. Unsafe flying, in the opinion of the judges, shall result in a zero score.

The flights shall be judged for technique, artistic quality and overall appearance as detailed in 6.1.8.2.. Excessive noise deters from the overall appearance and shall accordingly induce downgrading. A judging guide may define the judging criteria and their relative weights.

The music shall be chosen by each competitor according to his own taste. The competitor must provide the organiser with a record of the chosen music on CD, tape or any other suitable support.

For qualification flights, the music shall be of 120 seconds duration. When several qualification rounds are scheduled, the competitor may elect flying a different music and/or manoeuvre sequence for any one of such flights.

For semi-finals, when applicable, the music shall be of 180 seconds duration.

For finals, the music shall be of 240 seconds duration.

Music duration variations up to plus or minus 5 (five) seconds are allowed. The scored part of the flight begins at the moment the music starts and ends at the moment the music comes to an end.

#### **6.1.11. Timing procedures**

6.1.11.1 Before each flight, a competitor is entitled to 180 seconds preparation time after he has been given his transmitter(s).

6.1.11.2 At the end of the preparation time, or earlier if the competitor agrees to and the flight line is free, and with permission from the Field Marshall, the competitor or his helper may start his engine(s). The start of the take-off roll (the moment the aircraft moves under its own power) shall occur no later than 180 seconds after the moment permission has been given to start the engine(s).

6.1.11.3 During preliminary flights, a competitor must begin the scored portion no later than 30 seconds after the start of the take off roll.

6.1.11.4 During Music Compulsory and Music Free-Style flights, the competitor may elect to start his scored sequence (start of the music) at any time from the moment of the start of the take off roll until 30 seconds after this moment. He must express his choice to the Judges and timekeeper before the beginning of his flight and signal to the Steward the moment he wants the music to start. If he fails to signal this moment, the Steward will start the music 30 seconds after the start of the take off roll.

- 6.1.11.5 During Music Compulsory flights, scoring by the judges ceases, at the choice of the competitor, at landing or in flight. Whatever the choice, scoring stops at the moment the music stops.
- 6.1.11.6 During Music Free Style flights, scoring by the judges ceases at the moment the prescribed music duration comes to an end. At the choice of the competitor, this may occur at landing or in flight. Whatever the choice, scoring stops at the moment the music stops.
- 6.1.11.7 If the competitor elects ending his scored sequence while in flight, he must land his aircraft (the moment the aircraft first touches the ground on the designated landing area) within 30 seconds of the end of the scored sequence.

#### **6.1.12 Time penalties**

- 6.1.12.1. If the competitor fails to take off within the time allowed, the flight is scored 0 (zero).
- 6.1.12.2. If the competitor fails to begin the scored sequence within the time allowed, the flight is scored 0 (zero).
- 6.1.12.3. If the competitor fails to land within the time allowed after the end of the scored sequence, the flight is scored 0 (zero).
- 6.1.12.4. If the freestyle music lasts less or more than the prescribed duration, the flight score shall be reduced accordingly.

#### **6.1.13. Junior and National Team participation**

- 6.1.13.1 When at least 5 Junior competitors are competing, there shall be a separate Junior classification. Whenever possible, the Organiser should try organising separate flight groups for them.
- 6.1.13.2. National Teams, when applicable, shall consist of up to eight (8) competitors from the same Nation.
- 6.1.13.3. A National Teams classification shall be established, taking into account the scores of the three (3) top ranking competitors from each Nation.
- 6.1.13.4. National Junior Teams, when applicable, shall consist of up to five (5) competitors from the same Nation.
- 6.1.13.5. A National Junior Teams classification shall be established, taking into account the scores of the three (3) top ranking Junior competitors from each Nation.
- 6.1.13.6. The scores to be taken into account for Team classification shall be the final score of the competitors.
- 6.1.13.7. Results of Consolation Rounds shall not be taken into account for National Team classification.

## **RADIO CONTROL FREESTYLE AEROBATICS TO MUSIC**

### **6.2. CLASS F6B – AEROMUSICALS**

#### **6.2.1 Definitions**

##### **6.2.1.1 Definition of an AeroMusicals competition**

A competition in which pilots perform flights to music to express their piloting and artistic skills. The performance is judged on variety, precision and expressiveness.

There are three sub-classes according to the competition site:

- Sub-class A (indoor): for performance in restricted indoor halls
- Sub-class B: for performance in large indoor sport arenas or small-size outdoor sporting places
- Sub-class C: for performance in medium-size outdoor locations.

#### 6.2.1.2 Definition of an AeroMusicals aircraft

An electric-powered model aircraft, but not a helicopter, that is aerodynamically manoeuvred by control surface(s) in attitude, direction and altitude by a pilot on the ground using radio control,.

#### 6.2.2 General Characteristics of Radio Controlled AeroMusicals Aircraft:

Maximum total weight:

- Sub-class A: 500 g
- Sub-class B: 1000 g
- Sub-class C: 2000 g

Power source limitations: any suitable electric power source may be utilised. Batteries are limited to a maximum of 42 Volts for the propulsion circuit.

For better visibility, brightly decorated aircraft are recommended.

AeroMusicals Aircraft shall be controlled with commercially available radio control equipment. There are no restrictions on the number of control functions or auxiliary equipment. No other restrictions apply.

Paragraph B.3.1 of Section 4b (Builder of Model) is not applicable to class F6B.

#### 6.2.3. Definition and Number of Helpers

A helper may be a Team Manager, another competitor or an officially registered helper. Each pilot is permitted one helper during the flight.

#### 6.2.4. Attempts

6.2.4.1. There is an attempt when the competitor is given permission to start. Take-off shall take place within one minute after that moment.

6.2.4.2. Each competitor is entitled only one attempt for each official flight

**Note:** An attempt can be repeated at the contest director's discretion only when, for any unforeseen reason outside the control of the competitor, the aircraft fails to start (e.g. there is radio interference). Similarly, in a flight that is interrupted by any circumstance beyond the control of the competitor (e.g. sudden light shut-off, music airing malfunction, etc.), the competitor is entitled a re-fly. The whole flight shall be re-flown and scored as a whole.

#### 6.2.5. Definition of an official flight

There is an official flight when an attempt is made, whatever the result.

#### 6.2.6. Definition of a Round

A Round consists of one flight for each competitor entitled to fly in that Round. The number of rounds is established by the Organiser according to the planned competition duration.

#### 6.2.7. Number of Rounds

6.2.7.1. The competition shall be planned so as to limit the total duration. A competition duration from one hour up to no more than two hours is recommended.

6.2.7.2. The competition consists of one or several rounds leading to a final round. The starting order for the initial round is established by the Organiser according to any suitable accepted criterion. It is suggested that the starting order takes into account the competitors skill ranking (established by any generally accepted mean) so as to increase the spectators' interest from the beginning to the end of the round.

6.2.7.3. All pilots are entitled to fly the first round.

6.2.7.4. At the conclusion of each round, only the best ranking competitors are entitled to take part in the following round. The number or percentage of competitors flying in any following round is defined by the Organiser according to the expected competition duration.

6.2.7.5. The starting order for any round after the initial one is in reverse order of the classification at the conclusion of the last complete round.

6.2.7.6. The last round is called "Finals" with a limited number of competitors, preferably 2 (two) or 3 (three).

### **6.2.8 AeroMusicals flights**

6.2.8.1. These are flights where each competitor must compose his (her) own sequence of manoeuvres to suit a music of his own choice. Any manoeuvre can be flown, provided safety is ensured. Unsafe flying, in the opinion of the judges, shall result in a zero score.

6.2.8.2. The flights shall be judged for technique, artistic quality, variety, compliance with the chosen music and overall appearance. A judging guide defines the judging criteria and their relative weights.

6.2.8.3. The music shall be chosen by each competitor according to his own taste. The music shall be composed of alternating slow and faster tempo segments so as to enable the competitor to display the widest possible range of manoeuvres and mood impressions. The competitor must provide the Organiser with a record of the chosen music on CD, tape or any other suitable support. Details of the music used (composer, interpreter, CD label, etc.) shall be supplied to the Organiser for Public Performance Rights collection purpose.

6.2.8.4. The music shall be of 120 seconds duration. The competitor may elect to fly a different manoeuvres sequence and/or to a different music for any flight.

6.2.8.5. For Finals, at the Organiser's discretion the music may be of 240 seconds duration, provided this is specified in the initial competition invitation bulletin.

6.2.8.6. Music duration variations up to plus or minus 5 (five) seconds are allowed. The scored part of the flight begins at the moment the music starts and ends at the moment the music comes to an end.

### **6.2.9. Timing procedures**

6.2.9.1. Before each flight, a competitor is entitled to 180 seconds preparation time after he has been given his transmitter(s).

6.2.9.2. Once the competitor is given permission to start, he signals to the Steward the moment he wants the music to start. If he fails to signal this moment, the Steward will start the music 30 seconds after the permission to start has been given.

6.2.9.3. Scoring by the judges begins when the music starts and ceases at the moment the music stops. At the choice of the competitor, the end of the scored flight may occur at landing or in flight. If in flight, the competitor must land his aircraft quickly thereafter.

### **6.2.10. Time penalties**

6.2.10.1. If the competitor fails to take off within 30 seconds after the music starts, the flight is scored 0 (zero).

6.2.10.2. If the freestyle music lasts less or more than the prescribed duration, the flight score shall be reduced accordingly.

### **6.2.11. Scoring**

6.2.11.1. Judging

6.2.11.1.1. In general, all flights shall be judged by a panel of at least 3, and preferably 5, judges. The scores of all judges shall be taken into account.

- 6.2.11.1.2. Each flight may be awarded marks, in half point increments, from 10 to 0 by each of the judges and for each judging criterion as defined in the Judging Guide.
- 6.2.11.1.3. The score awarded by each judge shall be displayed immediately after each flight.
- 6.2.11.1.4. When the Final Round involves only two competitors, the Organiser may elect to have the winner elected by the spectators, provided this is clearly stated in the initial competition invitation bulletin. In this case, if the result of the spectators vote is not clearly decisive, the panel of judges shall have the decisive vote.

## **6.2.12. Classification**

- 6.2.12.1. All competitors are entitled to compete in the first round.
- 6.2.12.2. Scores are not carried over from one round to the following one.
- 6.2.12.3. The final classification is established according to the last round flown by the competitor and the classification in this round, in decreasing order from Final to initial Rounds and from highest score to the lowest.

## **RADIO CONTROL FREESTYLE AEROBATICS TO MUSIC**

### **6.3. CLASS F6C – HELICOPTER ARTISTIC AEROBATICS**

#### **6.3.1 Definition of an Artistic Aerobatics Helicopter**

An R/C helicopter is a heavier-than-air model aircraft that derives all of its lift and horizontal propulsion from a power driven rotor system(s) rotating about a nominally vertical axis (or axes). Fixed horizontal supporting surfaces up to 4 percent of the swept area of the lifting rotor(s) are permitted. A fixed or controllable horizontal stabiliser of up to 2% of the swept area of the lifting rotor(s) is permitted. Ground effect machines (hovercraft), convertiplanes or aircraft that hover by means of propeller slipstream(s) deflected downward are not considered to be helicopters.

Paragraph B.3.1 of Section 4b (Builder of the model) is not applicable to class F6C.

#### **6.3.2. General characteristics**

##### **6.3.2.1. Area**

The swept area of the lifting rotor cannot exceed 300 dm<sup>2</sup>. For helicopters with multiple rotors whose rotor shafts are more than one rotor diameter apart the total swept area of both rotors cannot exceed 300 dm<sup>2</sup>. For helicopters with multiple rotors whose rotor shafts are less than one rotor diameter apart the swept area of both rotors (counting the area of superposition only once) cannot exceed 300 dm<sup>2</sup>.

##### **6.3.2.2. Weight**

The weight of the helicopter (without fuel) must not exceed 6 kg.

##### **6.3.2.3. Motor**

Power source limitations: any suitable power source may be utilised except those requiring solid propellants, gaseous or liquefied gaseous fuels. Electric powered helicopters are limited to a maximum of 42 Volts for the propulsion circuit.

##### **6.3.2.4. Gyros**

An electronic rate gyro is permitted on the yaw axis only.

##### **6.3.2.5. Rotor Blades**

All-metal main or tail rotor blades are prohibited.

#### 6.3.2.6. Noise Limit

The noise level must be measured at a distance of 3 metres while the helicopter is hovering at eye level over the centre of a 2 metre diameter circle. During the measurement the helicopter must be rotated through 360 degrees to determine the maximum noise level. The sound pressure level must not exceed 90 dB(A) over a soft (grass) surface and 92 dB(A) over a hard (asphalt, concrete, etc.) surface.

The measurement will be made at the conclusion of any preliminary flight when, in the opinion of any one judge, the Field Marshall, the Contest Director or the FAI Jury, the helicopter is deemed too noisy

In the event a helicopter fails the noise test, no modification or adjustment to the helicopter shall be permitted (other than refuelling) and the helicopter shall be re-tested by a second noise steward using a second noise meter. In the event that the helicopter fails the re-test, the score for the preceding flight shall be zero. If this noise check was made at the conclusion of the first preliminary flight, another noise check shall be made at the conclusion of the second preliminary flight.

The measuring equipment must be calibrated to the dB(A) sound pressure level scale defined in applicable ISO Standards. If the noise measurement criteria cannot be met, the measurements will be advisory only and no competitor can be excluded from the competition.

#### 6.3.3. Definition and Number of Helpers

A helper may be a Team Manager, another competitor or an officially registered helper. Each pilot is permitted one helper during the flight. Two helpers may be present during the starting of the motor(s). The second helper may place the helicopter for take-off and retrieve the helicopter following the landing.

#### 6.3.4. Number of flights

- 6.3.4.1. The competition consists of preliminary rounds and one or several qualifying rounds leading to a final round. A semi-final round may be added at National, International competitions and World Air Games, but not at local or regional competitions. Preliminary round(s) are organised to establish the starting order for the first qualifying round. Organisers may elect to choose other methods resulting in a similar starting order.
- 6.3.4.2. A preliminary flight round consists of one flight for each competitor. A qualification, semi-finals or finals round consists of one Music Compulsory and one Music Free Style flights for each competitor.
- 6.3.4.3. All competitors have the right to an equal number of preliminary rounds. Only completed rounds will be taken into account.
- 6.3.4.4. All pilots flying are entitled to fly the first qualifying round. If there is a second qualification round, it will be open to no more than the top 80 % of the competitors. The number of competitors accessing the second round shall be determined by the Organiser before the beginning of the competition, and preferably in the preliminary competition information bulletin, according to the number of competitors and the time available. If more than two qualification rounds are flown, the Organiser shall similarly decrease the number of pilots accessing any subsequent round.
- 6.3.4.5. If there is a semi-final round, it shall be open to no more than the top 20 or 50 % remaining competitors, whatever is the smallest. The number of competitors accessing the semi-final round shall be determined by the Organiser before the beginning of the competition, and preferably in the preliminary competition information bulletin, according to the number of competitors and the time available.
- 6.3.4.6. The final round shall be open to no more than the top 10 or 50 % remaining competitors, whatever is the smallest, but at least 5. The number of competitors accessing the final round shall be determined by the Organiser before the beginning of the competition, and preferably in the preliminary competition information bulletin, according to the number of competitors and the time available.
- 6.3.4.7. At the discretion of the Organiser and provided this is specified in the competition preliminary information, the competitors not qualified for a further round may be allowed to participate in further, separate consolation rounds. Such rounds shall follow the same principle as the main competition rounds and the Organiser may choose how the competitors will be allowed access to the consolation

rounds. However, the main competition shall always have precedence if the time available does not allow all scheduled flights to take place and for the use of the best time frame for spectators and media.

6.3.4.8. At the end of the competition, competitors taking part in consolation rounds shall be ranked immediately after the last competitor qualified at the end of the first qualification round.

### 6.3.5. Definition of an attempt

There is an attempt when the competitor is given permission to start.

**Note:** If the competitor fails to take off within the three minutes allowed, he must immediately make room for the next competitor. If the motor stops before the helicopter is airborne, it may be restarted within the 3-minute starting period.

### 6.3.6. Number of attempts

Each competitor is entitled one attempt for each official flight

**Note:** An attempt can be repeated at the contest director's discretion only when, for any unforeseen reason outside the control of the competitor, the helicopter fails to start (e.g. there is radio interference). Similarly, in a flight that is interrupted by any circumstance beyond the control of the competitor (e.g. sudden rainfall, music airing malfunction, etc.), the competitor is entitled a re-fly. During the preliminary rounds, only the manoeuvre affected and the un-scored manoeuvres that follow will be judged. During the subsequent rounds, the whole flight shall be re-flown and scored as a whole.

### 6.3.7. Definition of an official flight

There is an official flight when an attempt is made, whatever the result.

### 6.3.8. Marking

#### 6.3.8.1. Judges

All flights shall be judged by a panel of at least 3, and preferably 5, judges. The scores of all judges shall be taken into account.

#### 6.3.8.1.1. Preliminary rounds

Each manoeuvre may be awarded marks, in half point increments, between 10 and 0 by each of the judges during the flight. These marks are multiplied by a coefficient, which varies with the difficulty of the manoeuvre. The manoeuvre sequence and the difficulty coefficients are established by the ad hoc sub-committee on a yearly basis and accepted by the CIAM Plenary Meeting.

Any manoeuvre not completed shall be scored zero (0). Manoeuvres must be performed where they can be seen clearly by the judges. If a judge, for some reason outside the control of the competitor, is not able to follow the helicopter through the entire manoeuvre, he may set the "Not Observed" (N.O.) mark. In this case, the judges' mark for that particular manoeuvre will only take into account the other judges' marks. Centre manoeuvres should be performed in the centre of the manoeuvring area while turn around manoeuvres should not extend past a line 60° left and right of centre. Vertical height, as seen from the judges' location, should not exceed 60°. Also, manoeuvres should be performed along a line of flight not more than 150 m in front of the pilot. Infractions of this rule will be cause for downgrading by each judge individually and in proportion to the degree of infraction. The manoeuvring area will be clearly marked with white vertical poles (or a colour contrasting with the surrounding colours), a minimum of 100 mm in diameter and a minimum of 4 m high, placed on centre and 60° each of centre on a line 150 m in front of the pilot. Flags and/or streamers of contrasting colour should be mounted on the poles to improve visibility.. White (or contrasting) lines, originating at the pilot's position and extending outward at least 50 m will also be used to mark the centre and extreme limits (60 degrees left and right of centre) of the manoeuvring zone. Audible and visual signals to indicate violations of the manoeuvring zone are not to be employed.

The judges shall be seated not more than 10 m behind the pilot's position (the apex of the 60 degree lines) and within an area described by the extension of the 60 degree line to the rear of the pilot.

If an helicopter is in the opinion of the judges unsafe or being flown in an unsafe manner, they may instruct the pilot to land. In this case, the flight will be deemed complete.

The raw score given by each judge for each competitor shall be made public immediately at the end of each preliminary flight.

#### 6.3.8.1.2. Qualification, semi-finals and finals flights

Each flight may be awarded marks, in half point increments, between 10 and 0 by each of the judges and for each judging criterion. Judging shall be done on:

- Technique (difficulty and precision of the individual manoeuvres) ;
- Artistic quality (originality, harmony & rhythm, composition and versatility of the entire flight sequence, adhesion to the music) ;
- Overall appearance (use of the flight space, positioning of the manoeuvres and general impression).

Thus each judge may award a maximum of 30 points to each competitor.

### 6.3.9. Classification

6.3.9.1. Unless stated otherwise in the Competition announcement, each competitor will have the right to two preliminary flights, the best one determines the preliminary ranking.

6.3.9.2. All competitors are entitled to compete in the first qualification round. The starting order is established according to the reverse preliminary ranking i.e. the competitor ranked last in the preliminaries start first in both flights of the first qualification round and the competitor ranked first starts last. If no Preliminary rounds are flown, the starting order shall achieve the same aim.

For each qualification flight, all scores will be normalised to 1000 points as described below:

$$\text{Points}_x = \frac{S_x}{S_w} \times 1000$$

Points<sub>x</sub> = point awarded to competitor X

S<sub>x</sub> = score of competitor X

S<sub>w</sub> = score of winner of the flight

6.3.9.3. The score at the conclusion of the preliminary rounds is the score of the best Preliminary flight.

6.3.9.4. The score of a qualification, semi-final or final round is the sum of the two flight scores of that round.

6.3.9.5. The intermediate score at any stage of the competition is the sum of all complete qualification and semi-final flight(s).

6.3.9.6. The flight starting order at the beginning of any round after the preliminary round is in reverse order of the intermediate classification at the end of the preceding round.

6.3.9.7. The final score is the sum of all complete qualification, semi-final and final rounds.

6.3.9.8. Provided this is specified in the competition announcement, the Organiser may elect to organise Airplane and Helicopter Artistic Aerobatics as a single competition with a common classification.

### 6.3.10 Tasks

#### 6.3.10.1. Preliminary rounds

During the preliminary rounds the competitors must fly a compulsory sequence of aerobatics manoeuvres judged for smoothness and precision.

The manoeuvre sequence and the difficulty coefficients are established by the ad hoc sub-committee on a yearly basis and accepted by the CIAM Plenary Meeting for application during the following year.

The manoeuvres sequence shall be prepared in such a way that manoeuvres are of essentially increasing difficulty. The sequence shall be composed so as to enable completion of the judged part of the flight in approximately 150 seconds. The sequence may include both translational and hovering manoeuvres.

There shall be no time limit for completing a flight, except that the competitor must begin the compulsory sequence within 30 seconds from the moment the helicopter lifts off and landing touch down must occur within 30 seconds after the last manoeuvre in the sequence has been completed.

Scoring shall be done using the Tarassov-Bauer-Long (TBL) system or a derivative of such system, as approved by the CIAM, or any other system approved by the CIAM.

#### 6.3.10.2. Music compulsory flights

These are flights where each competitor must compose his (her) own sequence of manoeuvres to suit a compulsory music. Any manoeuvre may be flown, provided safety is ensured. Unsafe flying, in the opinion of the judges, shall result in a zero score.

The flights shall be judged for technique (precision and difficulty of the individual manoeuvres), artistic quality (composition of the complete sequence, variety of the manoeuvres, rhythm and adherence to the music) and overall appearance. Excessive noise detracts from the overall appearance and shall accordingly induce downgrading. A judging guide shall define the judging criteria and their relative weights.

The music to be used will be chosen and prepared by the ad hoc sub-committee or equivalent on an annual basis and adopted by the CIAM Plenary meeting for application during the following year.

For qualification flights, the duration of the compulsory music shall be between 100 and 140 seconds.

For semi-finals, when applicable, the duration of the compulsory music shall be between 150 and 210 seconds.

For finals, the duration of the compulsory music shall be between 220 and 260 seconds.

#### 6.3.10.3. Music free-style flights

These are flights where each competitor must compose his own sequence of manoeuvres to suit a music of his own choice. Any manoeuvre can be flown, provided safety is ensured. Unsafe flying, in the opinion of the judges, shall result in a zero score.

The flights shall be judged for technique, artistic quality and overall appearance as detailed in 6.3.8.2.. Excessive noise detracts from the overall appearance and shall accordingly induce downgrading. A judging guide may define the judging criteria and their relative weights.

The music shall be chosen by each competitor according to his own taste. The competitor must provide the organiser with a record of the chosen music on CD, tape or any other suitable support.

For qualification flights, the music shall be of 120 seconds duration. When several qualification rounds are scheduled, the competitor may elect flying a different music and/or manoeuvre sequence for any one of such flights.

For semi-finals, when applicable, the music shall be of 180 seconds duration.

For finals, the music shall be of 240 seconds duration.

Music duration variations up to plus or minus 5 (five) seconds are allowed. The scored part of the flight begins at the moment the music starts and ends at the moment the scheduled duration comes to an end.

#### 6.3.11. Timing procedures

##### 6.3.11.1. Before each flight, a competitor is entitled to 180 seconds preparation time after he has been given his transmitter(s).

- 6.3.11.2. At the end of the preparation time, or earlier if the competitor agrees to and the flight line is free, and with permission from the Field Marshall, the competitor or his helper may start his engine(s). The lift-off shall occur no later than 180 seconds after the moment permission has been given to start the engine(s)
- 6.3.11.3. During preliminary flights, a competitor must begin the scored portion no later than 30 seconds after lift-off.
- 6.3.11.4. During Music Compulsory and Music Free-Style flights, the competitor may elect to start his scored sequence (start of the music) at any time from the moment of lift-off until 30 seconds after this moment. He must express his choice to the Judges and timekeeper before the beginning of his flight and signal to the Steward the moment he wants the music to start. If he fails to signal this moment, the Steward will start the music 30 seconds after the moment of lift-off.
- 6.3.11.5. During Music Free-Style flights, scoring by the judges ceases at the moment the prescribed music duration comes to an end. At the choice of the competitor, this may occur at landing or in flight. Whatever the choice, scoring stops, at the moment the scoring stops.
- 6.3.11.6. During Music Free-Style flights, scoring by the judges ceases at the moment the prescribed music duration comes to an end . At the choice of the competitor, this may occur at landing or in flight. If at landing, the flight is deemed complete, and timing stops, at the moment the helicopter first touches the ground on the designated landing area.
- 6.3.11.7. If the competitor elects ending his scored sequence while in flight, he must land his helicopter (the moment the helicopter first touches the ground on the designated landing area) within 30 seconds of the end of the scored sequence.

### **6.3.12. Time penalties**

- 6.3.12.1. If the competitor fails to take off within the time allowed, the flight is scored 0 (zero).
- 6.3.12.2. If the competitor fails to begin the scored sequence within the time allowed, the flight is scored 0 (zero).
- 6.3.12.3. If the competitor fails to land within the time allowed after the end of the scored sequence, the flight is scored 0 (zero).
- 6.3.12.4. If the freestyle music lasts less or more than the prescribed duration, the flight score shall be reduced accordingly.

### **6.3.13. Junior and National Team participation**

- 6.3.13.1. When at least 5 Junior competitors are competing, there shall be a separate Junior classification. Whenever possible, the Organiser should try organising separate flight groups for them.
- 6.3.13.3. National Teams, when applicable, shall consist of up to eight (8) competitors from the same Nation.
- 6.3.13.4. A National Teams classification shall be established, taking into account the scores of the three (3) top ranking competitors from each Nation.
- 6.3.13.4. National Junior Teams, when applicable, shall consist of up to five (5) competitors from the same Nation.
- 6.3.13.5. A National Junior Teams classification shall be established, taking into account the scores of the three (3) top ranking Junior competitors from each Nation.
- 6.3.13.6. The scores to be taken into account for Team classification shall be the final score of the competitors.
- 6.3.13.7. Results of Consolation Rounds shall not be taken into account for National Team classification.

## RADIO CONTROL HAND THROWN GLIDERS

### 6.4. CLASS F6D – HAND THROWN GLIDERS

#### 6.4.1 General

A contest where RC gliders must be hand thrown to altitude. The organiser must provide a sufficient number of timekeepers in order to allow enough simultaneous flights at all time. In principle, each competitor is allowed one helper who should not become physically involved in the flight. Handicapped persons may ask their helpers for assistance at launching and retrieving (catching) their glider.

The organiser should provide a transmitter impound where all transmitters are kept in custody while not in use during a flight or the corresponding preparation time.

#### 6.4.2. Definition of hand thrown gliders

Motorless model aircraft, with the following limitations.

- Wingspan max. .... 1500 mm
- Weight max. .... 600 g

Radius of the nose, minimum 5 mm in all orientations (see F3B nose definition for measurement technique).

The hand thrown glider must be launched by hand and are controlled by radio equipment acting on an unlimited number of surfaces.

The hand thrown glider can be equipped with holes, pegs or reinforcements, which allow better grip of the model aircraft by hand. The pegs must be stiff and remain a firm part of the model, neither extensible nor retractable. Devices, which do not remain a part of the model during and after the launch, are not allowed.

The competitor may at any times change his model aircraft as long as they conform to the specifications and are operated at the assigned frequency.

Each competitor must provide **five** frequencies on which his model aircraft may be operated, and the organiser may assign any of these frequencies for the duration of any round or the complete contest.

#### 6.4.3. Definition of the flying field

The flying field should be reasonably level and large enough to allow several model aircraft to fly simultaneously. The main source of lift should not be slope lift. The organiser must define the launching and landing area before the start of the contest and all launching and landings should happen within this area. Any launch or landing outside this area is scored zero for the flight.

A typical launching and landing area could be a rectangle 100m x 50m oriented with longer side perpendicular to the wind direction.

#### 6.4.4. Definition of landing

A landing is considered valid if:

- the glider comes to rest and at least one part of it touches the launching and landing area;
- the competitor catches the glider by hand (or if competitor is handicapped, his helper, if launching was made by this person), while standing with both feet inside the launching and landing area.

#### 6.4.5. Flight time

The flight time is measured:

- At task 1 from the moment the glider leaves the hands of the competitor
- At task 2 from the end of the launching interval

The flight time is measured to the moment the glider comes to rest on the ground or ground based object or the competitor catches the glider by hand or the working time expires. One point will be awarded for each full second the glider is flying, up to the given maximum flight time. One point will be deducted for each full second flown in excess of given maximum flight time.

The flight time is official if the launching happens from inside the launching and landing area and the landing happens inside this area.

#### 6.4.6. Organisation of rounds

The competitors are arranged in groups. A group should be a minimum of 5 pilots. The contest is organised in qualifying, semi-final and final rounds.

**At qualifying rounds** the task 1 and 2 is flown. The start and end of the working time are announced with a sound-signalling device. The results are normalised within each group, 1000 points being the basis for the winner of the group.

To the semi-final rounds the best pilot from each qualifying group proceeds. Other pilots, up to the number of 24, proceed to semi-final according to their normalised results. In case of tie at last proceeding places a draw decides.

**At semi-final** the pilots fly task 2 in three groups.

To the final group the best pilot from each semi-final group proceeds. Other five pilots proceed to final according to their normalised results. In case of tie at last proceeding places, the pilot with better result from qualifying round proceeds.

**At final** eight pilots fly the task 2 in one group. The number of pilots being reduced to one half at each consecutive attempt, so that at the last attempt only two pilots compete for the winner. The pilots with better results (higher number of points) from previous final attempts proceed to the next attempt.

For each round, the competitors receive at least 2 minutes preparation time, as announced by the organiser. During the preparation time, the competitor is allowed to turn on and check his radio, but is not allowed any launch of his glider, either outside or inside the launching and landing area.

#### 6.4.7. Final score

The winner is the pilot with best result from the final round (sum of three attempts). The third place gets the pilot which did not proceed to the last attempt with best sum of points from two final attempts. In case of a tie the results of the semi-final round are taken into consideration to get a clear ranking.

#### 6.4.8. Tasks

##### 6.4.8.1. Task 1 "Last flight":

During the working time, the competitor may launch the glider an undefined number of times, but only the last flight is taken into account to determine the final result. The length of the flight is limited to 5 minutes. Any additional release of the glider annuls the proceeding timing. When the competitor announces that he has completed his last flight (his official flight for this task), he must leave the launching and landing area, together with his timekeeper.

Working time - 7 minutes.

##### 6.4.8.2. Task 2 "All up":

All competitors of a group must launch their gliders simultaneously, within 3 seconds. The signal for launching comprises from three short beeps each second and a continuous tone lasting three seconds. During continuous tone the glider has to leave the hand of the pilot. Releasing the glider earlier or later

results in zero score for this flight. Maximum flight time is 3 minutes. Each flight time of the 3 attempts of each competitor is to be added up and will be normalised to obtain the final score for this task.

Example:

Competitor A:	45+50+35 s = 130 s =	812.50 points
Competitor B:	50+50+60 s = 160 s =	1000 points
Competitor C:	30+80+40 s = 150 s =	937.50 points