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Section 4 – Aeromodelling

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Lighter-Than-Air

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SECTION 4C – MODEL AIRCRAFT – F7 – LIGHTER-THAN-AIR MODELS

Class F7A – Balloons

RULE FREEZE FOR THIS VOLUME

With reference to paragraph A.12 of Volume ABR:

In all classes, the four-year rule for no changes to model aircraft/space model specifications, manoeuvre schedules and competition rules will be strictly enforced, but in step with the World Championship cycle of each category. Volume F7 contains only provisional classes and is not, therefore, subject to this restriction.

The only exceptions allowed to the four-year rule freeze are genuine and urgent safety matters, indispensable rule clarifications and noise rulings.

FEDERATION AERONAUTIQUE INTERNATIONALE

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1 FAI Statutes, Chapter 1, para. 1.6

2 FAI Sporting Code, General Section, Chapter 3, para 3.1.3.

3 FAI Statutes, Chapter 1, para 1.8.1

4 FAI Statutes, Chapter 5, para 5.1.1.2; 5.5; 5.6 and 5.6.1.6

5 FAI Bylaws, Chapter 1, para 1.2.1

6 FAI Statutes, Chapter 2, para 2.3.2.2.5,

7 FAI Bylaws, Chapter 1, para 1.2.3

8 FAI Statutes, Chapter 5, para 5.1.1.2; 5.5; 5.6, 5.6.1.6

9 FAI Sporting Code, General Section, Chapter 3, para 3.1.7

10 FAI Sporting Code, General Section, Chapter 1, paras 1.2. and 1.4

11 FAI Statutes, Chapter 5, para 5.6.3

12 FAI Bylaws, Chapter 1, para 1.2.2

7.1 PROVISIONAL CLASS F7A HOT AIR BALLOONS

7.1.1 Definition of a Hot Air Balloon

A hot air balloon is a lighter-than-air model airship, supported statically in the air, with no means of propulsion by any power source, which obtains its lift only as a result of heated air.

The envelope may contain no gas other than air and the normal products of combustion.

The hot air is produced by one or several radio-controlled burners using gas provided by inboard cylinders. The cylinders and the radio equipment are most often in a basket (not mandatory).

The hot air balloons must fit the national regulations for model aircraft (size, weight etc).

Hot air balloons above 50 kg or 200 m³, are subject to the international regulations for full size balloons and are not model airships. The weight of gas is limited to 2 kg for balloons under 12 kg (full fuel included) and to 5 kg for balloons equal or above 12 kg (full fuel included).

Note: Hot air balloons, like all Model Aircraft etc that have a mass over 20kg, are subject to an EU insurance requirement of some 900,000 Euros.

7.1.2 Marker

A marker is provided for each competitor by the organisers. . The markers must be of similar size and weight. The markers must be identified. Personal markers are not allowed. The competitor is allowed to make minor changes to adapt the marker to the dropping unit. The drop of the marker is radio controlled.

The organisers can implement additional identification items for the competitor, his assistant(s) and his balloon(s).

The target must be physical and clearly visible by the competitors.

7.1.3 Refuelling Area

The place for refuelling the cylinders of the balloon from master cylinders or tanks must be defined and secured by the organisers.

7.1.4 Inflating And Take Off Area

These areas must be away from the refuelling area. They must be defined by the Flight Director. It is necessary to have specific equipment (helium balloons, anemometer, wind vane etc) to verify the wind conditions.

7.1.5 Flying Site

The flights are most often outdoor flights (airport, aeromodelling site, open land etc) but indoor flights may be utilised in the case of adverse weather conditions. The flying site must fit the safety rules, be in accordance with the general rules for aerial circulation, have the necessary agreements from the appropriate authorities or owners and must allow normal flight of the balloons. Specific attention must be drawn to:

fire risks, personal risks, environmental risks; electric lines, roads, railways, houses, farms, crops etc;
restricted or protected areas (military sites, fuel storage sites etc).

7.1.6 Competition And Tasks

A competition is made up of several tasks.

A competition is valid if a minimum of three tasks (of which two are different) are validated.

There is no upper limit of the number of tasks.

Several examples of tasks are provided at paragraph 7.1.5 but any task can be created provided it is explained well to the competitors.

7.1.7 Panel of Judges

The Panel of Judges must have a Chairman, a Flight Director and one or more Judges. The Panel of Judges is defined prior to the start of the competition.

Usually the Chairman of the Panel of Judges will be the head of the organising Committee (most often an Air Model Club).

The Flight Director suggests the tasks to the Panel of Judges, controls the effective progress of the competition and ensures the proper application of the rules.

For international competitions, two judges are needed.

The judges may get help from assistants (measuring, timing) provided that these assistants are qualified or trained for the activity they have to perform.

Any decision from the Panel of Judges is obtained by majority vote and in the case of a tie the Chairman makes the final decision .

The "organisers" means the people organising the competition.

7.1.8 Competitor

Each competitor may have one or two balloons. A competitor having two balloons may use only one frequency.

A balloon may not be shared with other competitors.

A competitor may be helped by one or several helper(s).

7.1.9 Safety Rules

The handling of highly flammable gas (including liquid phase) requires strict observation of the safety rules.

The organisers and the members of the Jury must continually control the respect of the safety rules and, with no possibility of appeal, the Jury will disqualify any disrespectful competitor and immediately disqualify any other people.

Each pilot must have his own safety equipment (gloves, extinguisher).

7.1.9.1 Balloon

The cylinders must comply with the national regulations. The cylinders must have a security gauge. Pressure testing can be requested in some countries. The cylinders must be cleaned periodically but proof of the cleaning/testing is not requested. . Suspect cylinders must be rejected.



The pilot must be able to stop any flight presenting risk to the public or to the environment. The balloon must have a safety system allowing cessation of flight as required (such as: cut of lighter, cut of gas flow, time cut of burners etc). Additional equipment can be requested by national rules, and/or local rules.

An electric common earth connection is recommended (suspension of envelope, loading unit, cylinders, gauges, radio receiver). The propeller of the inflating unit must be protected.

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7.1.9.2 Refuelling Area

The area for refuelling or emptying the cylinders is under the supervision of the organisers . It must be a restricted area (allowed personnel only, no smoking), well ventilated and isolated from the public, the inflating area and the take-off area.

The refuelling is under the sole responsibility of the pilot. Smoking, the use of lighters, testing of burners and radio equipment etc are strictly forbidden. Any offender will be immediately disqualified with no possibility of appeal and will be legally responsible for any damage.

Specific equipment allowing several pilots to refuel can help and speed up the operation. An earth connection is suggested. Gloves must be worn during refuelling.

7.1.9.3 Take-off and Flight Area

Free flights are not allowed prior sunrise or after sunset.
Flights are not allowed if wind speed exceeds 2 m/s.
Suitable extinguisher(s) must be available.

7.1.10 Competition Rules

7.1.10.1 Organisation

Official national competitions are organised by recognised national air models organisations and must be declared to the national air models association.
It is the pilot's responsibility to obtain the latest issue of the competition rules.

7.1.10.2 Competitors

Unless specific conditions apply, entry is closed the day prior to the beginning of the competition.

By his entry, the competitor recognises he accepts, and will comply with, the competition rules and safety rules. The pilot must comply with the national regulations for air models such as (but not limited to): authorisations, pilot degree, insurances, radio equipment, gas handling, balloon features (volume, weight, radio equipment etc). Unless with specific agreement obtained from the authorities, the radio frequencies must fit the regulations of the organising country.

The organising Committee is responsible for the control of the equipment, weight of the balloon (full gas included), safety, frequencies, and insurances. This must be undertaken by the organisers prior to performing the first task.

A competitor is taking part in the competition as soon as he takes part in one task.

7.1.11 General Rules

7.1.11.1 Hot Air Balloon

No outboard heating or refuelling is allowed during flight.

Out of specific tasks (ie circle) the balloons must have no material link with the ground.

The balloon must not transmit any positioning or flight information to the pilot or to the helper(s).

The lowest part of the balloon (except radio antenna) determines the point of contact with the ground.

No structural changes are allowed except for safety equipment and radio receiver.

Prior to each task, removable weights may be added or subtracted.

7.1.11.2 Flight Rules

The Flight Director chooses the take-off area based on the task to be performed and on the weather conditions. He must clearly advise the competitors of his choice. This area may be different from the inflating area.

Each competitor may be helped by helper(s) during inflating, during take-off or after recovery of the balloon but not after leaving the take-off area. During a task, the competitor is allowed to follow his balloon and to receive external advice.

The flight starts when the basket leaves the take-off area so an attempt may be restarted until the balloon has left the take-off area. Take-off from outside the take-off area is a zero flight for the competitor.

After leaving the take-off area, any contact of any part of the balloon with any person, object or ground is considered a ground contact. Nevertheless, under specific weather conditions, some bounces may be accepted when leaving the take-off area. During a flight, deliberate contact of a balloon with other balloons is not allowed and penalties up to zeroing the flight of the offending competitor can be applied.

Any contact from the competitor (or from helper) with the balloon prior to dropping or landing is a zero flight. The position of the ground contact by the balloon is the sole decision of the judge(s).

If the dropping of the marker fails, the competitor may replace the marking with a landing. The first contact with the ground is then retained. No complaint will be accepted for the unexpected dropping of the marker.

Any moving of the marker, or of the landing position, by the competitor or by his helper(s)

disqualifies the competitor for the whole competition. This disqualification is mentioned in the

report of the competition. After dropping the marker, or after positioning of the landing, the balloon must be quickly retrieved to allow the other balloons to score under normal conditions.

The task of the competitor is ended by the marker drop, the landing or by withdrawal.

7.1.11.3 Tasks

Prior to the beginning of a task, the Flight Director must clearly inform the competitors of the type of task, the take-off area and of the management of the timing (flight opening, end of take-off time, target opening, target closing). These times are advised using any convenient system (horn, loud-speaker etc).

The opening of the flight must be advised early enough to allow the competitors an immediate take-off after flight opening. The competitor is free to decide when he will take off provided he does it during the allowed period.

If several attempts are allowed, only the last one is considered.

The Flight Director can:

- allow a competitor to restart a flight (circumstances must be clearly identified and advised);
- cancel a task if the weather conditions do not allow a normal and equivalent flight between the competitors;
- not validate a task if all competitors get no "points of flight".

7.1.12 Explanations and Protests

A competitor may ask for explanations from the Flight Director. He is allowed to verify (or let verify) his own results and the related calculations. If he disagrees with the results or if he contests attitudes or decisions, he may present a protest to the Panel of Judges. This protest must be in writing and accompanied by a fee equal to the amount of the competition entry fee.

The fee is returned only if the protest is upheld. A protest related to a task must be submitted prior to the beginning of the next flight. A protest related to the final results must be submitted by the competitor one day, at the latest, after the publication of the final results.

7.1.13 Scoring

7.1.13.1 Basic note

For each task, the competitor gets a basic score, which is the total of points of flight and of several bonuses (take-off bonus, intermediate bonus and precision bonus).

Unless otherwise specified, the bonus (take-off, intermediate, and precision) is 50 points each.

The "flight score" is based on distance or on time measurements. The distance to the target (cm or dm) is rounded to the closest unit (below/above 0.5). The time is entire obtained seconds. Unless otherwise specified, the maximum flight score is 500 points.

The flight score is zero if:

- take-off is out of the take off area;
- the drop of the marker or landing is out of the target opening time;

7.1.13.2 Normalising of scores

The aim of this calculation is to give the same weight to all the tasks of a competition.

For each task, the best competitor obtains a calculated score of 1000. The calculated score of the other competitors is a ratio to the basic score of the best competitor:

Calculated score = $1000 \times (\text{basic score of competitor} / \text{basic score of the best competitor})$

The ranking of each task is based on the calculated scores.

7.1.13.3 General ranking

If the competition has three or more tasks, the lowest normalised score for each competitor is discarded. Otherwise, all the normalised scores are retained.

The general ranking is obtained from the total of all the retained calculated scores.

7.1.13.4 Competition points

For each competition in which he participates, a competitor gets competition points equal to the total of his normalised scores divided by the number of tasks of the competition.

The yearly total of the competition points can be used (per se or not) for an annual ranking of the competitors.

7.1.14 Potential Tasks

(Not limited to those described here)

7.1.14.1 Target

Prior to the flight, the Flight Director places a target where he wants on the flight area.

The competitor takes off from a limited take-off area and must drop/land as close as possible to the target.

After leaving the take-off area, the competitor is not allowed to restart his flight.

Max Points of flight = 500.

Max distance from the target = 50 m.

1 decimetre = 1 point less from the maximum.

The precision bonus is obtained if the distance to the target is less than 1 metre.

7.1.14.2 Hesitation Waltz

Prior to the flight, the Flight Director places several targets on the flight site. The minimum distance between the targets must be 100 meters. The competitor chooses his target.

After leaving the take-off area, the competitor is not allowed to restart his flight.

Max Points of flight = 500.

Max distance from the target = 50 m.

1 decimetre = 1 point less from the maximum.

The precision bonus is obtained if the distance to the target is less than 1 metre.

7.1.14.3 Home

Prior to the flight, the Flight Director puts a target where he wants on the flight area.

The competitor takes off from a large take-off area allowing the pilot to choose a suitable takeoff place.

The competitor is allowed to restart his flight as long as the target is open. The last flight only is retained.

Max Points of flight = 500.

Max distance from the target = 50 m.

1 decimetre = 1 point less from the maximum.

The precision bonus is obtained if the distance to the target is less than 1 metre.

7.1.14.4 Fox

A first balloon (fox) is provided and flown by the organisers (not by a competitor). The fox takes off when all the competitors are ready for take-off. The target is either the dropped marker of the fox or the landing position of the fox (to be defined prior to starting the task). The flight of the competitors is opened a short time after the take off of the fox (30 seconds is suggested). The competitor decides when he will take off. He must drop as close as possible to the target. After leaving the take-off area, the competitor is not allowed to restart his flight.

The precision bonus is obtained if the distance is less than 1 metre.

Max Points of flight = 500.

Max distance from the target = 50 m.

1 decimetre = 1 point less from the maximum.

7.1.14.5 Line

Prior to the flight, the Flight Director defines the target as a physical line on the ground.

The competitor takes off from the take-off area and must drop as close as possible to the target.

After leaving the take-off area, the competitor is not allowed to restart his flight.

The precision bonus is obtained if the distance to the target is less than 10 centimetre.

Max Points of flight = 500.

Max distance from the target = 5 m.

1 centimetre = 1 point less from the maximum.

7.1.14.6 Area

Prior to the flight, the Flight Director defines a specific area on the ground (i.e. sport place).

The competitor takes off from the take-off area and must drop in the defined area and then land in the area. The objective is to get the maximum distance between drop and land. The competitor is not allowed to restart his flight.

The maximal distance (decimetres) is not limited. The distance to the target is directly used to get the points of flight. There is no precision bonus.

7.1.14.7 Stationary

The aim is to remain at a constant height from the ground for the maximum time.

The height is defined by the Flight director by using a rope. This rope is fixed to the basket by the competitor. The length of the rope must be short (around 25 cm) for indoor flights and longer (around 1 m) for outdoor flights. The free end of the rope must have a small weight to ensure the rope remains taut.

The competitor decides the beginning of the time to be counted. The time is stopped either by contact of the basket with the ground or by the marker/rope losing contact with the ground.

Max points of flight = 500,

Flight time limited to 500 seconds, each full second adds 1 point.

There is no precision bonus.

7.1.14.8 Circle

A circle is marked on the ground (10 metres diameter indoor and 20 metres diameter outdoor).

The target is a container (around 5 cm diameter indoor and around 10 cm diameter outdoor)

placed at the centre of the circle. The competitor guides his balloon toward the target using a rope which length is equal to the diameter. The rope is fixed to the basket. The competitor is not allowed to enter the circle or to hold the rope in any other way than at the end (flight score = zero). The flight time is limited to 5 minutes.

Max points of flight = 500 for inside flights,

1000 for outside flights.

1 centimetre = 1 point less from the maximum.

The precision bonus is obtained if the marker is dropped in the container.

7.1.14.9 Combined tasks

Combined tasks are made up of several tasks performed during the same flight.

The Flight Director must clearly advise the combination and flight timing.

For each task, the 3 types of bonus are applicable (unless there are restrictions in the tasks).