ANNEX 7l
Agenda Item 11.13 c)
F7 Volume – New Class F7B

PROPOSED NEW CLASS – F7B AIRSHIPS

7.2 CLASS F7B - AIRSHIPS

7.2.1. General Definition

7.2.1.1 Characteristics

An airship is an aerostat, supported statically in the air, with means of propulsion and direction by any onboard power source.

For gas airships, the envelope may contain non flammable, lighter than air gas (helium).

For hot air airships, 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 onboard cylinders. The weight of gas for burners and pilot line is limited to 5 kg whatever the size or the airship.

The radio equipment and the power sources are most often in a gondola (not mandatory).

The airship must fit the national regulations for model aircrafts (size, weight etc).

As for size airships, the block volume of an RC airship is obtained by Length x Width x Height and expressed in cubic meters. These measurements include fins, gondola etc but not the radio antenna.

In some tasks and to take account of the different size and shape of the airships a Distance or Time factor is applied to the distance or time measurements.

Length	Width	Height	Block volume	Distance Factor	Time Factor
L	W	H	BV= L x B x H	DF= Cube root of BV	TF= Square root of DF
4.50	*0.64*	*0.64*	*1.843*	*1.226*	*1.107*

The third line is provided as an example of calculation. All measurements are in meter

7.2.2 Pylons, Gates, Marker, Identification and Target

7.2.2.1 Pylons and gates

Pylons are provided by the organisers. Pylons are poles marking the pathways. These pylons can be implemented by pair to form a gate the airship should go through.

7.2.2.1 Marker

A marker is provided for each competitor by the organiser. The markers must be of similar size and weight and set to have minor effects on the airship when dropping. 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.

7.2.2.2 Identification

The organisers may implement additional identification items for the competitor, his assistant(s) and his airship(s). For international contests, each model shall carry a model identification code on the envelope and on the gondola (nationality plus FAI or NAC licence number of the competitor).

7.2.2.3 Target

The Flight Director is responsible for the flight management. If targets are defined, they should be advised early enough to allow the competitors to adapt their flight. The targets must be physical and clearly visible by the competitors.

7.2.3 Competition Site and Tasks

7.2.3.1 Refuelling area

For hot air airships, the place for refuelling the cylinders of the airship from master cylinders or tanks must be defined and secured by the organiser.

7.2.3.2 Inflating and Take-off Area

For hot air airships, the inflating and take-off area must be away from the refuelling area.

These areas must be defined by the Flight Director. It is necessary to have specific equipment (such as helium balloons, wind vane etc) to verify the wind conditions. An anemometer must be provided by the Organisers to measure the speed of the wind

7.2.3.3 Flight Site

The flights of gas airships are commonly indoor flights (hangars, gyms etc).

The flights of hot air airships 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 flight 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 airships.

7.2.3.4 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 in the last chapter but any task can be created provided it is fully explained to the competitors, the Panel of Judges and the Contest Officials.

7.2.4 Organisation

The Organiser must provide suitable sites (outdoor/indoor) that allow flights under any weather conditions with full performance of the competitors and safe recovery.

The Organiser is responsible for the control of the equipment, safety, frequencies, insurances and for the calculation of the scale factor of the airships. This should be undertaken by the Organiser prior to competitors beginning the first task.

Local rules established by the Organiser must be published no later than the latest bulletin made available to all competitors, preferably in advance of the entry deadline and early enough to allow each competitor to adapt his airship(s).

The Contest Director is in charge of the organisation. He is responsible for the good management and smooth and safe running of the event. He shall make operational decisions in accordance with the rules of the Sporting Code. He must secure a sufficient number of qualified officials (Panel of Judges and Contest Officials), provide the necessary equipment (electronic stopwatches, distance measurement devices, target equipment, helium balloons, anemometer etc).

For hot air airships, the Organiser should provide gas and nominate a person to be responsible of the refuelling area before the beginning of the competition.

The Organiser must display the results of each task throughout the contest and publish the final results afterward. The official results must be published within one month of the end of the competition.

7.2.5 Panel of Judges

7.2.5.1 Composition and Responsibility

The Panel of Judges must have a Chairman, a Flight Director and one or more judges. The Panel of Judges must be defined prior to the start of the competition. The members shall be chosen for their competence in RC Aerostats.

For International competitions, refer to rule ABR, Contest Officials (chapter B4).

It is the responsibility of the Panel of Judges to make any decision dictated by competition circumstances that may arise. It can penalise/disqualify a competitor for misconduct or infringement of the rules.

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.

7.2.5.2 Flight Director

The Flight Director must be a recognised pilot of radio controlled airships.

He defines the tasks and the flight conditions (pylons, gates, take-off area, targets, timing, maximum measured distance, restart allowance etc), controls the evolution of the tasks and validates the tasks.

The Flight Director may:

cancel a task if the weather conditions do not allow a normal and equal flight between competitors,

invalidate a task if all competitors receive a zero “flight score”.

7.2.5.3 Contest Officials

The Panel of Judges may get help from Contest Officials provided that these Contest Officials are qualified or trained for the activity they have to perform. The Contest Officials are in charge of measurements (size, distance, time), observation and reporting to the Panel of Judges of any deviation occurring during the competition.

7.2.6 Competitor and Helpers

It is the competitor’s responsibility to obtain the latest issue of the competition rules.

Unless specific conditions apply, entry is closed at a date defined by the Organiser.

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

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

A competitor may compete with one or two or airships but structural exchanges (such as gondola, fins or envelope) are not allowed between the two airships. A competitor competing with two airships may use only one frequency. Only one airship may be used during any task.

A competitor may not share his airship with other competitors.

A competitor may be helped by one or several helper(s). The helpers may act during preparation, during take-off and after recovery of the airship but not during the flight.

7.2.7 Safety Rules

The handling of high pressure gas (gas airships) or of highly flammable gas (including liquid phase, hot air airships) requires strict observation of the safety rules.

The Organiser and the Panel of Judges must always observe, comply with and apply the safety rules and ensure that competitors, organisers and any other person on the flying site complies with the safety rules. The Panel of Judges will summarily disqualify, without right of appeal, any competitor who infringes or ignores the safety rules and will exclude from the flying site any other person who deliberately infringes or ignores the safety rules.

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).

7.2.7.1 Airship

The competitor must be able to stop any flight presenting risk to the public or to the environment.

Gas airships should naturally go down if the propulsion is not running. The propulsion should allow to force the descent of the airship.

For hot air airships, 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. A common electric mass is recommended (suspension of envelope, loading unit, cylinders, gauges, radio receiver). The propeller of the inflating unit must be protected.

Hot air airships must have a security system allowing cessation of the 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.

7.1.7.2 Refuelling Area (Hot air airships)

The person responsible for the refuelling area has full authority to avoid/stop refuelling/emptying whenever the safety rules are not implemented or followed.

The area must be a restricted area (allowed personnel only, no smoking, no flames), well ventilated and isolated from the public, the inflating area and the take-off area. The area must not have any place where gas can accumulate. The area must allow fast evacuation.

The refuelling/emptying is under the sole responsibility of the competitor. Smoking, the use fire lighters, testing of burners and the running of electronic equipment such as, but not limited to, radio equipment, cameras and phones are strictly forbidden in the refuelling/emptying area. Specific equipment allowing several competitors to refuel can help and speed up the operation. An earth linkage is suggested. Gloves should be worn during refuelling.

7.2.7.3 Take-off and Flight Area

Free flights are not allowed prior to sunrise or after sunset.

Flights are not allowed if wind speed exceeds 7.2 km/h (2 m/s) measured at 2 m above the ground at the take-off area.

Suitable extinguisher(s) must be available.

7.2.8 General Rules during Tasks

7.2.8.1 Airship

The airship should have no material link with the ground (free flight).

The airship should not transmit any positioning or flight information to the competitor or to the helper(s).

The lowest part of the airship (except radio antenna) determines the point of contact with the ground (take-off or landing).

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

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

For hot air airships, no outboard heating or refuelling is allowed during flight.

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7.2.8.2 Flight Rules

These flight rules also apply to the airship provided by the Organiser (fox).

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.

The Flight Director shall clearly inform the Panel of Judges, the Contest Officials and the competitors of the timing of the flight: take-off opening and closing, target opening and closing.

Take-off from outside the take-off area is a zero flight score for the competitor.

Restart is not allowed.

During any task, the competitor is allowed to follow his airship and to receive external advice.

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Each contact with equipment implemented to define the waypoints, with obstacles which may affect the normal evolution of the airship or with the ground incurs one penalty. Deliberate contact used as a strategy for the flight incurs a zero flight score for the offending competitor.

Deliberate contact of an airship with another airship is not allowed and penalties up to a zero flight score for the offending competitor can be applied.

Any contact from the competitor (or from helper) with any airship prior to the completion of the task incurs a zero flight score.

Marking (marker on the ground) or landing should occur before the target closes otherwise the competitor will receive a zero flight score. The marker must be on the ground for the flight to count for scoring. 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.

The position of ground contact by the airship is solely the decision of the Contest Officials.

Any displacement of the marker, or of the landing position, by the competitor or by his helper(s) disqualifies the competitor for the whole competition.

After dropping the marker, or after the positioning of the landing, the airship should be quickly drawn away to allow the other competitors to score under normal conditions.

The task of the competitor is completed by the target closing or the marking, landing or withdrawal of the airship.

7.2.8.3 Tasks

Prior to the beginning of a task, the Flight Director must clearly inform the Panel of Judges, the Contest Officials and 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.

7.2.9 Explanations and Protests

A competitor may ask for explanations from the Flight Director. He is allowed to verify (or have verified on his behalf) 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 Contest Director. This protest must be in writing and accompanied by a fee of 35 Euros. The fee is returned only if the protest is upheld.

Before the opening of the contest, protest must be lodged at least one hour before the opening of the contest. During the contest, protests should be submitted immediately (prior to the starting of the next flight). After announcement of the final results, any protest should be submitted within 15 days after announcement of the results.

7.2.10 Results

7.2.10.1 Basic Score

For each task, the competitor gets a basic score, which is the total of the flight score, of several bonuses (one take-off bonus, one or several intermediate bonus(es) and one precision bonus) and of penalties. The basic score cannot be negative.

The maximum flight score is 1000 points.

The bonuses (take-off, intermediate, precision) are 100 points each. The penalties are 250 points each.

The “flight score” is based on distance or on time measurements.

The flight score is zero if:

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

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(a) Distance

The maximum measured distance is clearly advised by the Flight Director before the task begins. This distance is adapted to the local conditions and to the measurement units.

The use of a laser measurement unit is suggested.

The distance is rounded or not to the closest precision unit according to the calculation means.

In some tasks, the measured distance is recalculated using the length factor to obtain the calculated distance.

Maximum measured distance (MMD)	**Accuracy (0.1% of MMD)**	**Precision bonus if (distance <1 % of MMD)**
100 m	10 cm	distance < 100 cm
50 m	5 cm	distance < 50 cm
10 m	1 cm	distance < 10 cm or in the container (outdoor circle)
5 m	0.5 cm	distance < 5 cm or in the container (indoor circle)

b) Time

The accuracy of the measured times is tenths of a second.

In some tasks, the measured time is recalculated using the time factor to obtain the calculated time.

7.2.10.2 Calculated Score

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 x (basic score of competitor/basic score of the best competitor)

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

7.2.10.3 Competition Score and Ranking

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

The competition score is the total of the retained calculated scores divided by the number of retained tasks.

The competition ranking is obtained from the competition score.

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

7.2.11 Potential Tasks

(Not limited to those described here).

All the necessary information for the completion of the task shall be advised by the Flight Director to the Panel of Judges, the Contest Officials and the competitors (see chapter 7.2.8.3).

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

7.2.11.1 Regatta, Time Scaled

Two pylons, placed in a distance defined by the Flight director (25 meters suggested) are to be circled in figures eights three times. Start and goal for each airship is thought line, marked by one of the pylons and perpendicular to the thought line between the pylons. This line is marked by a third pylon. The competitor should complete his attempt within maximum 10 minutes. This time includes the preparation of the airship and the completion of the task. The maximum measured time is five minutes. Time is measured when the front part of the airship crosses the start/goal line. The aim is to obtain the lowest run time.

If the airship fails to turn out of the pylons, the competitor must perform a new bend otherwise he gets a five minutes time.

Calculated time = measured time x Time factor.

Flight score = 1000 x calculated time of best competitor / calculated time of the competitor

7.2.11.2 Regatta, Length scaled

Two pylons, placed in a distance defined by the Flight Director (25 meters suggested) are to be circled in figures eights within five minutes. Start and goal for each airship is thought line, marked by one of the pylons and perpendicular to the thought line between the pylons. This line is marked by a third pylon. Time is measured when the front part of the airship crosses the start/goal line. The competitor should perform his attempt within maximum 10 minutes. This time includes the preparation of the airship and the completion of the task. The aim is to obtain the longest run distance. Only entire bases are taken in account. If the airship fails to turn out of the pylons, the competitor must perform a new bend otherwise he gets a zero flight score.

Calculated distance = Number of entire obtained bases x Distance between pylons x Length factor

Flight score = 1000 x calculated distance of the competitor / calculated distance of the best competitor

7.2.11.3- Slalom

Gates are placed on the flight site and should be cleared in a specific order within five minutes. The width of the gates should be large enough to allow an easy crossing by the largest airship. Start and goal for each airship is through the start/goal line. Time is measured when the front part of the airship crosses the start/goal line(s).
The aim is to obtain the lowest run time.

A circuit and intermediate gates are defined using any suitable equipments (poles, balloons...) and should be performed in the defined order by the airship of the competitor. The Flight director defines if all the competitors compete together or one after another. If all competitors compete together, contacts between airships do not incur penalties. The competitor should perform his attempt within maximum 10 minutes. This time includes the preparation of the airship and the completion of the task.

For individual races, the time counting starts when the nose of the airship crosses the start line. For together races, the time counting starts at the Flight director signal.

The time counting ends when the nose of the airship crosses the finish line.

If an airship fails to clear a gate, the related competitor is not allowed to retry and gets a five minutes time.

Calculated time = Measured time x Time Factor

Flight score = 1000 x calculated time of best competitor / calculated time of the competitor

7.2.11.4 Target

Prior to the flight, the Flight Director places, or permits to be placed, a target where he wants on the flight area. The competitor takes off from a limited take-off area and should drop/land as close as possible to the target.

7.2.11.5 Hesitation Waltz

Prior to the flight, the Flight Director places, or permits to be placed, several targets on the flight site. The minimum distance between the targets should be double the maximum measured distance.

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

7.2.11.6 Back Home

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

The competitor takes off from a large take-off area allowing the competitor to choose a suitable take-off place. He must drop/land as close as possible to the target.

7.2.11.7 Fox

A first airship (fox) is provided and flown by the organisers (not by a competitor).

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/land as close as possible to the target.

7.2.11.8 Line

Prior to the flight, the Flight Director defines the target as a physical line on the ground and advises if the drop/landing should be performed before, after or before and after the line.

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

7.2.11.9 Area

Prior to the flight, the Flight Director defines a specific area on the ground (ie 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 landing.

The distance between the marker and the landing (unit to be advised) is directly used to get the flight score. There is no precision bonus.

7.2.11.10 Stationary

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

The height is defined by the Flight director by using a rope. This rope is fixed to the gondola 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 gondola with the ground or by the rope losing contact with the ground.

The maximum measured time is 250 seconds. Each tenth of second is 0.4 point. There is no precision bonus.

7.2.11.11 Combined tasks

Combined tasks are made up of several tasks performed during the same flight. The failure to complete a task does not prevent the competitor attempting to perform the next task, nor should the flight be stopped.

The Flight Director must clearly advise the combination of the tasks, the flight timing and the flight/scoring conditions of each task.

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