

CHANGES OF THE FAI SC 4 VOLUME SPACE MODELS 2014 THAT RELATE CLASSES S5 AND S7

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PART TWO – SPACE MODEL SPECIFICATIONS

A space model must comply with the following requirements prior to launch, operation and flight.

2.1 WEIGHT

Gross or maximum weight, including space model engine or engines shall in no event exceed 1500 grams. It will be specified separately for each class in these rules.

2.2 PROPELLANT

No more than **200 g** of propellant materials shall be contained in its space model engines nor shall their total impulse exceed 160 Newton-seconds (Ns).

2.3 STAGES OF OPERATION

2.3.1 There shall be no more than three (3) operable stages. A stage is defined as a portion of the model airframe containing one or more space model engines that is designed to separate or which actually separates from the model while in flight. An un-powered part of the model is not considered to be a stage. The configuration of a model is considered to be that of the model at the instant of first motion on the launcher. Engines ignited simultaneously are considered one stage regardless of the number of separated parts; for example Soyuz.

2.3.2 Total impulse of engine(s) in a lower (booster) stage must, for safety reasons, be equal or greater than total impulse of engine(s) in (any) of upper stage(s). The thrust of the booster stage also must be equal or greater than the thrust of each of the upper stages. This does not relate the strapped-on boosters which are ignited simultaneously with the booster stage.

2.4 CONSTRUCTION REQUIREMENTS

2.4.1 A space model shall be so constructed to be capable of more than a single flight and shall contain a means for retarding its descent to the ground so that its structure may not be substantially damaged and so that no hazard is created to persons and property on the ground.

2.4.2 A space model must not eject its engine(s) in flight unless it/they is/are enclosed in an airframe that will descend in accordance with the provisions of paragraph 2.4.1. The engine(s) of the models cannot be fastened by glue and cannot be an integral part of model's construction.

2.4.3 Construction shall be of any modelling material without substantial metal parts. A substantial metal part is a nose cone, body tube, fins, any hard, sharp and external pointed part or any internal heavy metal part that can cause injuries to persons or damages to property.

2.4.4 Minimum dimensions of subclasses of classes S1, S2, S3, S6, S9 and S10 must not be less than:

Event Class	Minimum diameter (mm) (for at least 50% of the overall length)	Minimum Overall Length (mm)
A	40	500
B	40	500
C	50	650
D	60	800
E	70	950
F	80	1100

In the case of Class S1 models, the smallest body diameter must be not less than 18 mm for at least 75% of the overall length of each stage. An S1 sustainer stage may not have a boat tail.

The minimum dimensions of Class S5 must not be less than:

Event Class	Minimum diameter (mm) of each stage	Minimum overall length (mm)
A	20	400
B	25	500
C	30	600
D	40	800
E	50	1000
F	60	1500

Class S5 models shall have a minimum diameter of an enclosed airframe equal or larger than that in the table above for at least 50% of the overall length of each stage.

- 2.4.5 Design and construction shall include attached surfaces that will provide aerodynamic stabilising and restoring forces necessary to maintain a substantially true and predictable flight path. If required by the rules for a specific class, local rules for competition and/or safety officers or judges, the builder of the model must present data regarding the locations of the centre of gravity, centre of pressure, gross weight, burnout weight, and/or calculated or measured flight performance of the model. These data must be submitted with models S5 and S7 at model processing before a model is entered to competition.
- 2.4.6 A space model shall not contain any type of explosive or pyrotechnic payload. A prefabricated ejection charge for ejection of a recovery device, in conjunction with a space model engine(s), shall not be considered explosive or pyrotechnic payload.
- 2.4.7 Models in Classes S4, S8 and S10 must fly and land without separation of any part in flight.

PART NINE - SCALE COMPETITION (CLASS S7)

9.1. DEFINITION

Scale competition is a single event and is limited to flying space models that are true scale models of existing or historical guided missiles, rocket vehicles, or space vehicles.

9.2. MULTI-STAGE PROTOTYPE

If the entry is a scale model of a multi-staged vehicle, it may be designed so that one or more of the upper stages are inoperable dummies. However, the upper stage of a multi-staged vehicle may not be entered and flown without its operable lower stages unless specific data is furnished to the judges to prove that the upper stage configuration was designed to be or has flown separately, alone, and as a vehicle itself. For example, all Aerobee rockets must have operable boosters.

9.3. SELECTION OF PROTOTYPE

The competitor must have modelled one particular serial-numbered prototype, except in the case where the prototype is in such large mass production that there is no single individual vehicle that can be singled out for scale modelling purposes. However, the competitor shall make every reasonable attempt to model a specific prototype.

9.4. PROOF OF SCALE

The competitor must supply scale data to substantiate his model's adherence to scale in dimension, shape, colour, and point pattern. Minimum allowable data consists of length and diameter of the prototype and one photograph. Further data is certainly encouraged. Dimensional data must be from an accurate source such as magazines, books, manufacturer's specifications or data sheets, etc. Photographs from any sources are acceptable. All data presented should apply to the particular prototype that is modelled and entered. Judges may deduct points for incorrect data.

9.5. KITS

Flying scale space model kits may be used as a source of design, materials, etc. and acceptable for entry only if accompanied by scale substantiation data other than that contained in the kit or available from the kit manufacturer. The competitor shall be responsible for ascertaining the correct scale qualities of the kit and must present satisfactory evidence that the kit model is correct to scale.

9.6. STABILISING FINS

Scale models of rockets, missiles or space vehicles that are not fin-stabilised may be fitted with transparent plastic fins so as to make the model stable in flight while detracting the least from the scale qualities of the model

9.7. PLASTIC MODEL KIT PARTS

Parts from plastic model kits may be used on scale space models provided that this use is pointed out in the data presented with the model at the time of judging for scale qualities.

9.8. CONDITIONS OF MODEL FOR JUDGING

Models will be judged for scale qualities in flight condition minus space model motors. All clear plastic fins, launching lugs, and fittings and other flight items must be attached to the model for scale judging. Nothing may be added to or taken off the model between the scale judging and the flight except space model motors and recovery device packing.

9.9. MAXIMUM WEIGHT AND IMPULSE

Maximum allowable gross launching weight is limited to 1500 grams.

Maximum allowable total impulse is 160,00 Newton-seconds. Maximum engine size allowed is 80 Newton-seconds.

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9.10. NUMBER OF FLIGHTS

Each entry must make a stable flight, and two (2) opportunities will be available to the competitor for this purpose, time and weather permitting.

9.11. SCALE JUDGING

Scale quality points will be awarded to each entry according to the following schedule:

- 9.11.1. A competitor who presents the following proper technical data may be awarded with points defined in the paragraphs below only for items documented in these technical data:
- authentic, authorised drawing(s) of the prototype with at least ten dimensions and three cross sections, i.e. data which define colour of cross sections and markings on it;
 - workshop drawing of scale model - scale 1:1;
 - at least one colour photograph of the whole prototype with clearly visible details of colour and markings;
 - at least three photographs of details and assemblies;
 - file containing all necessary technical data including data regarding the locations of the centre of gravity, centre of pressure, gross weight, burnout weight and/or calculated or measures flight performance of the model necessary for safety reasons.
- 9.11.2. **Adherence to scale:** 200 points maximum. To be considered as a scale model the dimensions of the body diameter and overall length should not depart from scale by more than 10% or else the model is disqualified. This rule shall not be applied to dimensions less than 10 mm. The judging category should be judged in two areas: 1) model dimensions - 150 points maximum; 2) colour and markings - 50 points maximum.
- 9.11.3. **Workmanship:** 250 points maximum. To be judged on neatness, care of construction, and degree of finish. The judging category will be judged in two areas: 1) workmanship of nose cone, body, fins and details - 150 points maximum; 2) finish of nose cone, body and fins - 100 points maximum. Deviations from scale finish such as a high gloss finish on a model that should have a flat or dull finish will detract from maximum points.
- 9.11.4. **Degree of difficulty:** 150 points maximum. To be judged on the degree of difficulty involved in constructing the model up to 110 points. Factors to be considered include symmetry of model; number of external components; intricacy of paint pattern; degree of detailing; and degree of difficulty in adapting the model for flight conditions. A bonus of 40 points for “originality” shall be awarded to a prototype that is the only one in the competition and a bonus of 20 points shall be awarded if two prototypes of the same kind enter the competition. No bonus points shall be awarded if there are three or more models of the same kind.
- 9.11.5. **Flight, characteristics:** 300 points maximum. To be judged on launch, stability of flight, staging (if any) and recovery. A competitor has to designate which operations his models are to perform in flight (eg separation of stages; radio controlled trajectory; ejection of payload, etc).
- If the model has been disqualified in both official flights, the competitor will not be eligible for final classification.
- 9.11.6. In the case of World and Continental Space Modelling Championships dimension deviations from the Scale shall be measured by a separate qualified measuring team approved by the FAI Jury. The measured dimensions will be presented to the Scale Judges for verification and included with the Scale Judging Data.
- 9.12. Should the model experience a catastrophic failure, be incapable of additional flights (4.6.3.) and have scored no Flight Characteristic points, the competitor’s static scale points will be taken to decide final classification.

PART TEN - SCALE ALTITUDE COMPETITION (CLASS S5)

10.1. DEFINITION

This series of events involves altitude competition with scale space models and is a combination of the altitude competition (Part 5) and the scale competition (Part 9). The objective of the competition is to achieve the highest altitude with a scale space model.

10.2. RULES

All entries must comply with the rules of Scale competition (Part 9) and will be judged under the same rules and receive the same number of maximum scale quality points except that three flights will be allowed and no flight characteristics points will be given.

ALTITUDE DATA rules 4.9 will be used for this competition.

10.3. SCORING

The total number of scale quality points awarded to an entry will be added to the highest official altitude achieved by the entry. Only in the case of "no close" or "track lost", no altitude points are added but the flight is considered qualified and the competitor's static points will be taken to decide the final classification. Otherwise, if the model does not make a qualified flight after three attempts, the final classification will be zero.

The entry having the largest number of total points resulting from adding the static scale quality points to the altitude in metres achieved from the same flight, will be declared the winner. In the event of a tie, the points gained for scale quality will be decisive.

10.4. DISQUALIFICATION

The judges must disqualify from scale altitude competition any entry which, in their opinion, does not show sufficient scale qualities or evidence of normal level of workmanship required for a scale model under the provisions of the scale competition (Part 9). The intent of this rule is to eliminate from scale altitude competition any entry which has scale qualities grossly subordinated in favour of altitude performance qualities.

10.5. SUB-CLASSES

Scale Altitude Competition may be flown in the following classes:

CLASS	TOTAL IMPULSE (Newton-seconds)	MAXIMUM WEIGHT (g)
S5A	0,00 - 2,50	90
S5B	2,51 - 5,00	120
S5C	5,01 - 10,00	150
S5D	10,01 - 20,00	180
S5E	20,01 - 40,00	240
S5F	40,01 - 80,00	500

ANNEX 1

SCALE SPACE MODELS JUDGE'S GUIDE

EVENT:..... () Scale (Class S7)
 () Scale Altitude (Class S5)

Name: _____

FAI Licence Number: _____

Competitor Number: _____

National Team: _____

Prototype Name: _____

Prototype Serial Number: _____

DISQUALIFICATIONS

(Applicable FAI Rule Number Shown in Parenthesis)

Prototype is not a guided missile, rocket, or space vehicle (9.1)

Entry has no lower stage (multi-stage prototypes only) (9.2)

No length and/or diameter data supplied for prototype (9.4)

No photograph of prototype supplied (9.4)

Entry utilises plastic kit parts not identified as such (9.7)

Entry not submitted in flight configuration (minus motors and recovery device packing) (9.8)

Entry does not carry competitor's FAI number (4.4.2)

FAI CATEGORY	SUB-CATEGORY	JUDGING CONSIDERATIONS	POINTS
Technical Data	Prototype Drawings	To what degree is external prototype detail substantiated by drawings? How authentic are these drawings compared to prototype manufacturer's drawing? - authentic, authorised drawings - authentic cross-section drawing(s) - data which define colour and markings on it. - workshop drawing of scale model - scale 1:1 - file containing all necessary data including those from paragraph 4.4.3	Note: no points for technical data. Check only what is submitted of the required data and below, give points only to those items documented by these technical data.
	Prototype Photographs	To what degree are external prototype detail, colour, and marking substantiated by photographs? - at least one colour photograph of the whole prototype with clearly visible details. - at least three photographs of details and assemblies	
FAI CATEGORY	SUB-CATEGORY	JUDGING CONSIDERATIONS	POINTS
Degree of Difficulty	Configuration	To what degree does the entry depart from the configuration of a "finned cone-topped cylinder.	(0-30)_____
	External Components	Consider the number and complexity of the entry's external components including fins, transitions, interstage adapters, shrouds, strap-	(0-20)_____

	Detailing	<p>on booster, launch lugs, antennae, etc. Also consider to what extent the aforementioned components were prefabricated by none other than the entrant.</p> <p>Consider the number of separate details including nuts, bolts, screws, rivets, fasteners, welds, hatches, panels, corrugations, etc. Also consider to what extent the aforementioned details were prefabricated by anyone other than the entrant.</p>	(0-20)_____
	Paint Pattern	<p>consider the number of colours and complexity of the entry point pattern. Also consider the number and complexity of the entry's markings and to what extent these markings were prefabricated by anyone other than the entrant.</p>	(0-20)_____
	"Flyability"	<p>Consider the difficulty in adapting the entry to make a qualified flight including absence of fins, small fin area, extremes of CP and/or CG, etc.</p>	(0-30)_____
	"Originality"	<p>Bonus points: 40 points for a prototype of one kind in the competition; 20 points if there are two of the same prototype; zero points if there are three models of the same prototype.</p> <p>Category Total (150 Max)</p>	(0-40)_____

FAI CATEGORY	SUB- CATEGORY	JUDGING CONSIDERATIONS	POINTS
Scale Adherence	Colour	Comparing the entry to colour photographs, paint samples, or other colour substantiation, to what degree does the entry's colour(s) resemble that prototype's colour?	(0-25) _____
	Markings (lettering & insignia)	Comparing the entry to photographs, marking diagrams, or other marking substantiation, to what degree to the entry's markings resemble the prototype's markings?	(0-25) _____
	Dimensions	Overall model length	(0-25) _____
		Nose cone length	(0-25) _____
		Greatest measurable body diameter	(0-25) _____
		Length of the first stage	(0-25) _____
		Fin span (individual fin or tip-to tip)	(0-25) _____
		Selected dimension greater than 10 mm (second stage length, diameter, etc.)	(0-25) _____
Award points shall be based on a % deviation from the prototype's scaled dimensions. Each 1% error reduces the value by 2 points. Deviation > 10% shall be awarded a value of 0.			
* If prototype is finless, select one other dimension greater than 10 mm and check here ()			
Category Total (200 Max)			

FAI CATEGORY	SUB- CATEGORY	JUDGING CONSIDERATIONS	POINTS
Workmanshi p	Construction	Consider the absence of visible glue joints, that edges and demarcations should be precise, that planar surfaces should be flat, etc.	
		Nose cone & transitions	(0-40) _____
		Body	(0-40) _____
		Fins or Stabilising surfaces (including clear plastic)	(0-30) _____
	Finish	Details	(0-40) _____
		Consider that surface textures should duplicate base material of prototype; that paint and other surface coatings should be uniform (unless this would deviate from prototype’s finish) thin, dust-free and of the proper texture; that colour demarcations and markings should be crisp* and precise.	
		Nose cone & Transitions	(0-40) _____
		Body	(0-40) _____
		fins	(0-20) _____
		*	
Category Total (250 Max)			

FAI CATEGORY	SUB-CATEGORY	JUDGING CONSIDERATIONS	POINTS
Flight Characteristics	Launch	Was the launch successful? If not, subtract 10 points for each misfire or hang-fire for a maximum of minus 30 points (0 or minus)	_____
	Flight	Realism of launch compared to prototype. Was the take-off speed abrupt or was it a smooth lift off from the launch pad?	(0-30)_____
		Realism of flight. Was it a vertical flight without weather-cocking of launcher tip-off? No rotation unless prototype rotated. Stable straight flight without oscillation?	(0-30)_____
	Special Effects	Did the model exhibit any special effects such as Launching a space probe, separating boosters, radio control devices, ejecting satellites, deploying shield, scale launcher, gliding recovery etc. Special effects can only emulate the actions of the prototype. Maximum of 15 points for each effect.	(0-60)_____
	Staging	Add 30 points for each successful stage separation. No points for a single stage model.	(0-60)_____
	Clusters	Add 5 points for each engine that ignites up to a maximum. No points for single engine models.	(0-30)_____
	Staging and Cluster Misfires	Subtract 15 points for each engine that fails to ignite.	(0 or minus) _____
	RC Gliding Descent	Stable gliding, realism of gliding descent of the prototype and safe landing without damage.	(0-50)_____
	Recovery	Single stage model (or booster stage) Recovery device deployment (1 parachute – 10 points)	(0-20) _____
		Multi stage model (upper stage(s)) Recovery device deployment (1 parachute – 10 points, 1 streamer – 5 points)	(0-20)_____
		Category Total (300 Max)	_____

ANNEX 2

SPACE MODELLING JUDGES AND ORGANISERS' GUIDE

1. PURPOSE and FUNCTION of JUDGES GUIDE:

The purpose of this guide is to provide a uniform understanding, interpretation and application of the FAI Sporting Code for Spacemodelling. This guide describes how Spacemodelling Judges and other officials will officiate at the World or Continental Space Modelling Championships. Judges must acquaint themselves with the FAI Sporting Code, Section 4 Aeromodelling volume ABR (Sections A & B) and volume SM - Space Models.

2. JUDGES TASKS:

Timekeepers/Field Monitors/Judges Duties:

- a. Impound, safeguard, and distribute certified contest engines.
- b. Impound, safeguard, and distribute FAI approved payloads.
- c. Impound, safeguard and distribute electronic altimeters.
- d. Maintain stocks of flight cards as needed for the competitors.
- e. Check models and recovery devices for proper identification.
- f. Measure the size of recovery devices, if needed.
- g. Know the maximum time limit for each duration type round.
- h. Determine flights adherence to rules and safety. (safety rulings will also be made by the RSO or his deputies).
- i. Declare disqualifications and note rationale on flight cards.
- j. Time and record duration data onto flight cards.
- k. Ensure completed flight cards are sent for data reduction.
- l. Check-in and out stop watches, binoculars, and clipboards as needed to perform their duties.

Special Judge Duties:

- a. Announces the start and stop of each round/event.
- b. Responsible for the check-in and out of judges' stop watches, binoculars, electronic altimeters and other tools.
- c. Radio control events require that all transmitters (including 2.4 GHz) be impounded and kept under control of a steward and be issued to the competitor at flight time then returned. The steward or the judge will also monitor radio frequencies to detect interference and communicate this information to the pilot.
- d. Altitude competitions with electronic altimeters require that all electronic altimeters be impounded and kept under the control of a steward and be issued to the competitor at the flight time and then returned.

Safety and Rule Compliance Officials:

- a. Will give models and recovery devices a pre-flight safety and rule compliance inspection and mark each part.
- b. Attest to the appropriateness of submitted FAI payloads.
- c. Supervise calibration of electronic altimeters.

Engine Test Officials:

- a. Will attest to the certification of team submitted engines.
- b. Engines will not exceed Newton Seconds value of class.
- c. Test two engines of each batch.
- d. Any failure of tested engines requires rejection of batch.
- e. Batch is defined as the engines required for one engine class in an event regardless of delay length. Maximum three batches are allowed per an engine class per an event.

Electronic Altimeter Test Officials:

- a. Will attest to the certification of team submitted electronic altimeters.
- b. Will give electronic altimeters to competitors and after flights readout, register and safely store results during the competition and when competition is finished to present them on an electronic memory to the organiser of the event..

Scale Judges:

- a. Will award scale static and flight points in accordance with scale judging guide.
- b. Will be responsible for giving copies of the scale judging forms used to record a competitor's points in Scale (S7) and Scale Altitude (S5) to each competitor in these events, before the end of the contest.

3. GENERAL JUDGING CRITERIA:

Experience shows that often two different sets of eyes, knowing the same rules, and seeing the same occurrence will result in two different opinions on what happened. The following section attempts to anticipate areas where different judgements can occur and provide the definition and interpretations necessary so we can reduce potential ambiguities on the field.

- a. **Who can disqualify a flight (DQ).** The RSO and his deputies are the only persons who can disqualify a flight in the FAI First Category events (World Air Games, World and Continental Championships and International sporting events approved by CIAM). Time-keepers may be called upon to make decisions on flight adherence to rules and safety in the FAI Second Category events (other international sporting events organised by or under the authorisation of NACs. In the case of Scale competition (Class S7), Scale Judges who judge flights for flying characteristics shall continue to judge even if the RSO declares a DQ, in case any protest is upheld by the FAI Jury and the points given for flight characteristics shall then count.
- b. **Catastrophic Failure.** A catastrophic failure by nature of the name has to be obvious. You as a judge must know of the failure when it occurs. To look later at what appears to be a normal spent casing after a flight while a competitor argues that the delay was too long, short, or missing offers no proof to the claim of a catastrophic failure.
- c. **Instability.** Any non-glider model that loops while coasting or thrusting in unstable. Unstable models are unsafe and cannot be qualified. Likewise, a power pod that detaches from an otherwise true-flying model and spins about, disqualifies the flight.
- d. **Unsafe Recovery.** Crashes and other unsafe recoveries cannot be qualified. What constitutes an unsafe recovery? The rules state it is one that creates a hazard to property or people. For consistency let us ask ourselves if we would like to be under the rocket we are judging when it lands. If the answer is "no" then a disqualification is called for especially during payload flights where no minimum size parachute is required.

In the case of scale models unsafe recovery is when a recovery device (parachute or streamer) of a substantial part of the model ie nose cone, any of the stages or boosters does not deploy and can be hazardous for persons or property on the ground. If a streamer or a parachute of a smaller and insignificant part of the model eg light Styrofoam or similar forms that represent satellites or other special effects does not deploy properly, then this is not a reason for disqualification but for a reduction of points for Flight Characteristics, Recovery.

4. SPECIFIC EVENTS:

a. Rocket Glider and Boost Glider.

These models must ascend in a near vertical/non-shallow manner. Where is the cut off on a shallow ascent? Interpret this as a qualified flight: a glider that ascends under power at an angle or more than 60 degrees from the horizontal.

Glider also may not loop while thrusting. After burnout, during the engine coast and ejection, looping is permitted - as long as the model does not present a safety hazard to people or property.

Rocket Gliders cannot separate into two or more pieces; boost gliders may eject an engine pod. The pod (airframe) must descend by streamer or parachute..

Glider have to have a stable aerodynamic glide recovery. Often opinions will differ on "what is a glide." Here is how to interpret this. The recovery has to be effected by a stable, predictable, aerodynamic glide with air passing over the wings. The model must descend with a nearly horizontal angle of attack. When is the descent not a glide? Imagine a pilot inside a full sized glider exhibiting the same flight characteristics as the

model you are judging. Would you be willing to trade places with the pilot? A “no” earns the flight a disqualification. Rationale: No glide is unsafe recovery.

In classes S4, S8 and S10, a flight is declared official if the model maintains a stable aerodynamic glide for at least 60 seconds, or it lands by stable flight.

b. Streamer Duration.

Streamer lengths have to be a 10:1 ratio to widths minimum.

Rules state that a streamer has to be a single piece of flexible material. This shall be interpreted as one uncut, no joints, homogeneous piece, not two or more pieces, joined together to form one length.

Rules state that a streamer must unfurl. This shall be interpreted to completely unfurl so that the 10:1 length/width ratio is exhibited. A small ball of wadded streamer at the end of an almost completely unfurled streamer, then must disqualify the flight.

FAI rules do not prohibit streamers that form loops or bows once fully deployed. If the wind loops a streamer fully deployed the flight must be considered official as long as no ground hazard results.

c. Payload Flights. See General, paragraph 3d. Unsafe Recovery.

d. Scale Events. : The scale judges will judge scale models for flight characteristics in accordance with Annex 9 particularly taking care of the following:

d.1. Flight Characteristics-Staging: Stages must separate step by step. If the 3rd stage separate simultaneously with the 2nd stage the flight will be considered two stage only. With Saturn 1B and Soyuz if the competitor performs a powered flight of command module, this shall be evaluated as "modeller's third stage" , according to paragraph 2.3.1.

d.2. Flight Characteristics - Special Effects: As Special Effects (according to the judging rules) may only emulate the action of the prototype. Three staged rockets, like Ariane, shall not deploy nose cone cover shield and jettison a satellite during operation of the 1st or 2nd stage. On the contrary, with Saturn or Soyuz function of rescue system during the 1st stage operation is planned and possible. In case of doubt, competitor is obliged to prove reality of declared special effect by relevant technical data. How many points award for several special effects? Compare the degree of difficulty of four booster separation to smoke before lift off!

d.3. Cluster : “Cluster” should be understood to be a set of more than one engine placed in more than one nozzle of the scale model and which shall ignite simultaneously. They are exact replica of a multi nozzle prototype one nozzle of the prototype – one spacemodelling engine. So if four engines are ignited simultaneously judges shall give points for cluster 4 time 5 point – 20 points. For prototypes with only one nozzle in which some space scale modellers use to put cluster of smaller space models engines points for cluster shall not be awarded (so 4 times 10 Ns engines tied together in one nozzle is zero points for cluster). However, if one of these engines does not ignite – it is “Misfire” that should be punished with minus 15 points. This shall be easy to understand if you compare a degree of difficulty of a set of engines placed in model nozzles like at a prototype - distant from the longitudinal axis of a model in comparison with a several engines tied together in centre of model's body.

d.4. Flight Characteristics-Recovery: For single stage, one parachute up to 10 points will be awarded. If a single stage rocket separates up to 20 points will be awarded. With multistage models deployment of a parachute will be awarded up to 10 points and a deployment of streamer 5 points. Maximum recovery points in any case may not exceed 40. To prove if the scale models to be launched are the same models which were submitted for static judging, judges will designate each model with an appropriate marking during the static judging.

e. Parachute Duration.

Parachutes must deploy. No minimum sizes are stated. Where then is the cut off of a deployed parachute and one not deployed? FAI rules state that at least three shroud lines make up the parachute. Broadly speaking: “to deploy” means “to widen”. The working definition on a “deployed” parachute then will be one which exhibits at least three shroud lines and widens out when ejected. Thus, if a model descends under a crumpled wad or slender stick of parachute material then this is not deployment. However, if the model descends with the parachute partially open or spread out as a fan, the flight is qualified. This un-blossomed parachute will be timed and considered an official flight. The descent must still be safe.

The decision of the RSO or his deputies on matters of safely takes priority.

5. ORGANISERS TASKS:

Before the beginning of any Spacemodelling competition, the organiser is obliged to provide conditions for competition in accordance with the provisions of the FAI Sporting Code, Section 4 Aeromodelling, Volume ABR, paragraph B.12.

- a. Scale Events** - The organiser of an international contest shall appoint three scale judges from the nomination list of Space Models FAI Judges. In case of World or Continental Championships, there will be appointed five FAI judges and one reserve judge of different nationalities, including the Chief Scale Judge. Their names will be submitted to the CIAM or CIAM Bureau for approval. The Chief Scale Judge may not be from the organising NAC. He shall organise work of the judging panel and shall represent it. An extra judge (who may be the reserve judge) shall be appointed as the chief of the dimension measuring team.

In World and Continental Championships a panel of five judges shall award their points independently. The highest and the lowest score shall be neglected and the average of the remaining three scores shall give the final score. In World Cups and/or in Open International-non World Cup events a panel of three judges not necessarily from different countries shall give points.

The organiser shall also provide an adequate area for relevant number of entries with bright overhead lights and with tables for turn in, static judging and dimension measuring. The static judging area will be equipped with dimension measuring devices and a PC with a qualified operator. Access to the static judging area during static judging will be restricted to all persons except for static judges, dimension measuring team, PC operator, contest director and FAI Jury.

b. Altitude Events

b. 1. Tracking by Theodolites: Organiser of an international altitude event must provide altitude measuring devices in compliance with the rule 4.9.1.2. and qualified personnel for altitude measuring. He also must provide radio communications between tracking stations, RSO and the computer centre in the field. Altitude measuring team shall do test tracking on duration and/or scale models on the day preceding the competition day(s) for altitude events to check tracking and data reduction systems. The head of the altitude measuring team shall present test altitude measuring results to the Jury to prove altitude measuring team readiness and necessary accuracy of measurements and get Jury approval, before the official flights begin in an altitude event.

b. 2. Use of Electronic Altimeters: The organizer must provide a calibration tool for simultaneous calibration of all electronic altimeters in use. This tool shall have reference altitudes of 300 m, 600 m and 1200 m. Devices that meet the technical specifications given in paragraph 4.9.2.1. of these rules may be used In contests. The organizer shall preferably for World and Continental Championships provide electronic altimeters of the same type and from the same manufacturers that can be distributed or sold to the participants after the contest. The organizer, also, shall provide an pound for all altitude devices and a log in which shall be recorded when and to whom the devices are issued and when they are returned. This shall be controlled by two stewards. There shall be two launch site monitors at each launch site and four field monitors in the recovery area that may serve as time-keepers in duration classes. Results shall be read, recorded and then posted on the score board just after model recovery.

- c. Range Safety Officer (RSO)** - Organiser of an international contest will appoint a person to act as Range Safety Officer (RSO) from the FAI nomination list of judges – specialised in spacemodelling. He may appoint other qualified persons to act as his deputies in accordance to the provisions of the rule 4.3. In case of World or Continental Championships, organiser of the contest shall submit name of RSO to CIAM or CIAM Bureau for approval. RSO may not be from the organising NAC. When there are junior and senior classifications at the same place and at the same time organiser shall appoint two RSO, one for senior and the other for junior classification. They shall be not of the same nationality but shall have one language in common.