SPACE MODELS TECHNICAL MEETING MINUTES

Held at Hotel Movenpick in Lausanne (Switzerland) on Fridy, 8th April, 2016

PRESENT: Srdjan Pelagic (SRB), delegate, SM S/C Chairman
Joze Cuden (SLO), delegate, SM S/C member,
Gerhard Woebbeking, (GER), EDU S/C Chairman, observer
Zoran Pelagic, PhD, (SVK), alt.deelgate, SM S/C member,
Hans Stoll, (SUI)SM S/C member,
Igor Volkanov, (UKR), SM Sc member,
John Langford, PhD, (USA), SM S/C member,
Chris Flanagan (USA), observer.
Jenny Lu,(CHN),alt. delegate.
Mehmet Arslan,(TUR), delegate.

A G E N D A

1. Space Models rules changes 2016,
2. Preparation for WSMCh 2016 and bids for future SM Cat 1 events,
3. Consideration of change the SM S/C Chairman
4. Any other business.

Item 1

There were 37 proposals for the SM rules changes carefully discussed and considered. Conclusions and recommendations to the CIAM Plenary meeting are given in Annex 1.

Item 2

Igor Volkanov (UKR) gave a complete information on preparations for WSMCh 2016 to be held in Lviv (UKR). Everything shall be ready this event to be conducted at the higher FAI standards. SM TM was notified that EuSMCh 2017 shall be in Poland and for the next WSMCh 2018 is only the bid from Poland. SM TM supports this bid.

Item 3

Srdjan Pelagic informed SM TM that he is SM S/C Chairman for 20 years and he wishes to see younger man with new ideas at this position. So, he shall not stand up for reelection this time. SM TM notified his work and thanked Mr Pelagic for his work. There are two candidates for this position, these are Joze Cuden(SLO) and Zoran Pelagic (SVK).

Item 4

There were no issues to be discussed.

Lausanne (SUI), 8th April, 2016

Srdjan D. Pelagic, dipl.ing.
CIAM Space Models SC Chairman

ANNEX 1

14.13 Section 4C Volume S – Space Modelling

PART ONE – GENERAL DEFINITIONS

a) 1.1 Space Model **Space Modelling Subcommittee**

Replace 1.1 with the new definition as shown below:

SC VOTES:8/2/0
TM VOTES:9/1/0
For approval

1.1 SPACE MODEL

~~"Space Model" means an aeromodel that ascends into the air without the use of aerodynamic lifting forces against gravity; that is propelled by means of a space model engine; that includes a device for returning it safely to the ground in a condition to fly again; and that is made of substantially nonmetallic parts.~~

1.1 SPACE MODEL

Model rocket or rocket glider - a model that rises into the air without the use of aerodynamic lift forces to overcome the gravitational forces set in motion by a rocket engine (s) using a vertical or near vertical free-ballistic flight by the force of the thrust rocket engine a cone with an angle of 60 °, oriented vertically on the launching device, comprising a device for safe return to the ground in a position that allows its reuse and constructed primarily of non- metallic materials.

Reason: This preamble gives an insight into the general requirements to any and all categories of space simulation and removes existing contradictions.

SC VOTES:10/0/0
TM VOTES:10/0/0
For approval

PART TWO – SPACE MODEL SPECIFICATIONS

b) 2.4.4 Minimum Dimensions **Space Modelling Subcommittee**

Delete S5 in the sentence as shown:

Minimum dimensions of subclasses of classes S1, S2, S3, ~~S5~~, S6, S9 and S10 must not be less than:

Reason: Correction. The S5 class has its own table of minimum dimensions in an extra table.

SC VOTES:4/5/1
TM VOTES:4/3/3
Withdrawn

c) 2.4.4 Minimum Dimensions **Space Modelling Subcommittee**

After the first table in this paragraph, change the first sentence as follows:

In the case of Class S1 models, the smallest body diameter must be not less than ~~18~~ **25** mm for at least 75% of the overall length of each stage. An S1 sustainer stage may not have a boat tail.

Reason: In relation to class S1 it is necessary to have bigger models because of better visibility.

Technical Secretary's Note: The above proposal was also submitted by the USA. The USA added additional supporting data which has been reproduced below:

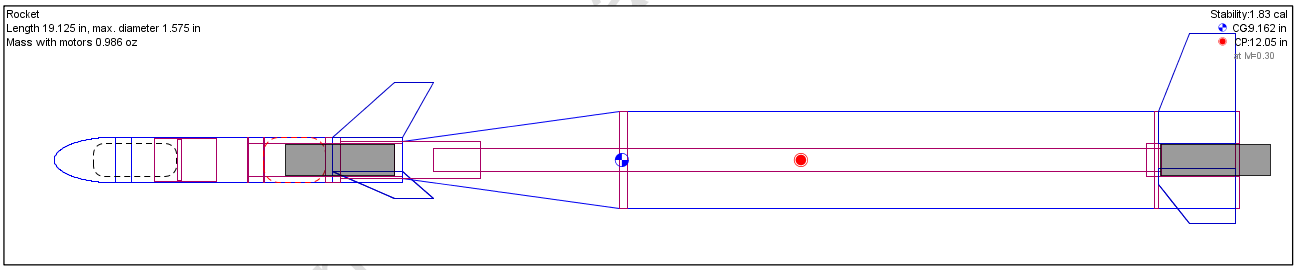
Using current model sizes, an 18mm diameter S1 sustainer stage flies to altitudes where the model is extremely difficult to see. This makes it very challenging for the Range Safety Officer (RSO) to assess if the recovery system of the model has deployed safely. The high altitude also makes it difficult for the competitor to see and successfully recover the model. Increasing the minimum required diameter of the sustainer stage will reduce the apogee height, thereby improving visibility for the RSO and the competitor.

As noted by Gerhard Wöbbeking[1], "such a pencil disappears in the sky up to total invisibility, even the ejected streamer remains invisible on descend in many cases." "Even worse, the invisibility of the second stage and the difficulty to retrieve the altimeter increasing with the height turns the sport upside down: The better the performance the more likely is no result. May the mediocre win!?"

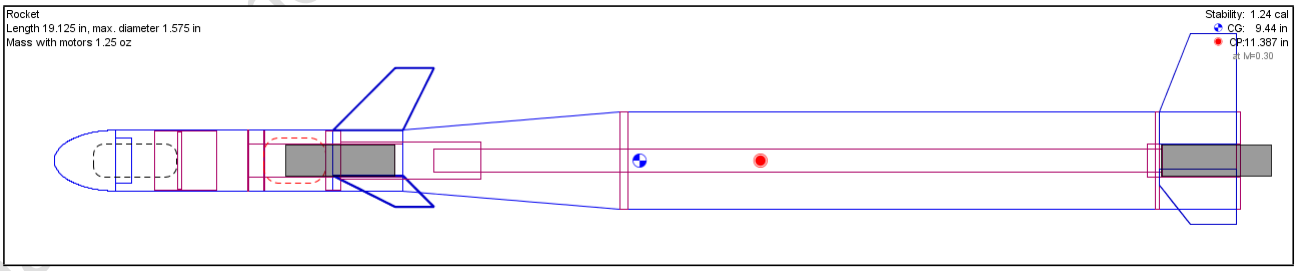
The first illustration below shows a typical S1B model that conforms to the dimensions specified in the SM Code, 2015 version. The winning flights at the 2012 and 2014 World Spacemodeling Championships were approximately 700 meters altitude or above. At these altitudes, the sustainer cannot be seen.

The second illustration shows an S1B model that has a 25 mm diameter sustainer. Altitude calculations predict that using a 25 mm sustainer will reduce the maximum altitude by ~20%. The sustainer is ~33% more visible. This will improve visibility for the contestant and the RSO, and will make it easier and more reliable to recover the model and its altimeter.

18mm diameter sustainer (2013 rules)



24mm diameter sustainer



[1]Wöbbeking, Gerhard, "Remarks on the EuCh for Space Models 2015", October, 2015.

d) 2.4 Construction Requirements SC VOTES:1/8/1 TM VOTES:1/4/5 Withdrawn **Space Modelling Subcommittee**

Add a new paragraph 2.4.8:

2.4.8 The upper stage in class S1 shall be prepared to carry a payload of 12 g, which partly or totally may be replaced by an electronic altimeter and/or a GPS tracker.

Reason: Because of the performances especially of the current S1- classes too often space models are lost in the sky and the best results with greatest heights (more than 400 or even 600 m) can't be verified. Thus the sport is turned upside down: The better the performance the more likely there is no result. A defined payload will:

a) reduce the performance in order to gain again a fair competition according to the tasks of our sport, and

b) offer volume to combine altimeter with GPS tracker.

An altimeter weighs about 1,2 g, the battery 1 - 2 g. Newly developed GPS transmitters weigh 4,7 g without battery; because of the higher current a battery of about 240 mAh capacity (5,5 g with wires) will feed both, altimeter and transmitter. A payload of 12 g will be suitable for the technology of today and can in future – step by step with further developments – be reduced to the absolute necessary.

PART FOUR – GENERAL RULES FOR INTERNATIONAL CONTESTS

e) 4.1 World Championship Events for Space Models — USA

Revise 4.1 to allow a wider range of events and impulse classes at World Championships as shown below:

WORLD CHAMPIONSHIP EVENTS FOR SPACE MODELS

The following event **categories** are recognised ~~(2001)~~ as World Championships for Space Models:

SC VOTES:2/8/0
TM VOTES:5/1/2
For Plenary voting

~~i) W/CH for Senior classes:~~

a) altitude models – **S1**~~(delete B)~~ **, S2, or S2/P**
b) parachute duration models – **S3**~~(delete A)~~
c) boost glider duration models – **S4**~~(delete A)~~
d) scale altitude models – **S5**~~(delete C)~~
e) streamer duration models – **S6**~~(delete A)~~ **or S6/P**
f) scale – S7 **or S11**
g) rocket glider duration and precision landing models – **S8**~~(delete E/P)~~
h) gyrocopter duration models – **S9**~~(delete A)~~

The events and total impulse classes shall be selected by the contest organiser. One event is required for each category. Different events and total impulse classes may be selected for Senior and Junior classes.

~~ii) W/CH for Junior classes:~~

~~a) altitude models S1A~~
~~b) parachute duration models – S3A~~
~~c) boost glider duration models – S4A~~
~~d) scale altitude models – S5B~~
~~e) streamer duration models – S6A~~
~~f) scale – S7~~
~~g) rocket glider duration models – S8D~~
~~h) gyrocopter duration models – S9A~~

Reason: The FAI Space Modelling code includes a wide variety of events and total impulse categories. However, Rule 4.1 currently specifies eight specific event/impulse classes for World Championships. This causes a significant incentive for competitors to focus on only these eight classes and neglect all other events and impulse classes.

The proposed change to Rule 4.1 will provide greater flexibility to the World Championship organiser and provide greater incentive to the space modelling competition community to experience more events and impulse classes.

f) 4.4.3 Builder of the Model **Space Modelling Subcommittee**

Add a new sentence to the end of the paragraph as follows:

SC VOTES:3/7/0
TM VOTES:10/0/0
For Plenary voting

4.4.3 Builder of the Model

The judges shall make every reasonable effort to insure that each competitor has completely constructed the model entered in the competition with "construction" to be interpreted as the action required to complete a model starting with no more prefabrication than the amount used in the average kit. Models that are completely prefabricated or require only a few minutes of unskilled effort for their completion shall be excluded from competition. Materials and design may be obtained from any source, including kits. . The competitor must himself prepare his model for flight assisted by one helper, who must be a junior in junior classifications.**This paragraph does not apply to class S8.**

Reason: F3K model aircraft (hand launched gliders) equipped with an engine housing proved being the ultimate gliders as well for the S8 classes. Building these models demands skills and efforts beyond the ability of the most pilots. In order to avoid unfair conditions the B.o.M.-rule has to be skipped for S8.
All competitors qualified for the final of the FAI European Championships for Space Models 2015 class S8E/P used F3K models.

g) 4.9 Altitude Data **Space Modelling Subcommittee**

Move the paragraph 4.9.1.5 'Visibility of Models' (bold type) to the introductory paragraph 4.9. 'Altitude Data' as shown below. The numbers 4.9.1.5 will therefore be deleted

Add 'and competitors':

SC VOTES:2/7/1
TM VOTES:1/6/3
Withdrawn

For measuring and calculating altitudes, the methods that may be used are based on the principles of triangulation, or electronic or radar tracking. **All models that are to be tracked for altitude shall disperse a coloured powder at ejection which will aid tracking. Theodolite operators and competitors may lose track of models which do not contain sufficient powder or contain powder which does not contrast well with the sky. The organiser will have tracking powder available for competitor's use.**

Reason: Because of the performances especially of the S1- and S5- classes too often space models are lost in the sky and the best results with greatest heights (more than 400 or even 600 m) can't be verified.

Of 79 flights in the class S1 (Juniors and Seniors) during the EUCh 2015 not less than 21 got no result. In most cases the competing team lost sight of the model during its climb and wasn't able to retrieve the second stage together with the altimeter.

SC VOTES:10/0/0
TM VOTES:10/0/0
For approval

h) 4.9.2.1 Electronic altitude measurements **Bureau**

Replace the entire section 4.9.2.1 with the paragraph below:

4.9.2.1 Electronic altitude measurements with an electronic altimeter shall use the new Sporting Code Volume EDIC – Electronic Devices in Competition – Section 2 - Technical Guidance Notes and Technical Specification for Altimeters Used in Space Modelling Competition V.1.0 for the documentation regarding specifications and guidance.

Reason: Electronic devices to be used in Space Models FAI international competitions must be treated in the same way as those used in other categories with detailed specifications, instructions for use and also for their technical testing to be put on the list of devices which satisfy all demands for each category. Therefore CIAM Bureau established a specialised EDIC WG to deal with technical aspects of electronic devices and all specifications and guidance on electronic devices shall be collected in a separate EDIC Volume of SC.

PART SIX – PAYLOAD COMPETITIONS (CLASSES S2 & S2/P)

SC VOTES:9/0/1
TM VOTES:10/0/0
For approval

i) 6.2.5 Scoring

Revise rule 6.2.5 to correct the scoring equation to agree with the text of the rule:

6.2.5. Scoring

The score for each flight shall be the absolute difference between the recorded altitude and 300 met**re**s (always a positive number) plus 3 times the absolute difference between the recorded duration and 60 seconds (always a positive number). Any flight which is disqualified for a reason other than a broken fragile payload, or which receives no altitude score, shall receive a score of 100 for that flight. The score for the event shall be the sum of the scores from each of the three flights. The lowest score is the winner. In the case of tie the best (the lowest score) in a round is decisive.

The following scoring formula shall be used for point allocation:

B = ~~INT~~ **ABS**(H-300) + 3 * ~~INT~~ **ABS**(T-60),

where B = points awarded to the competitor,
H = flight altitude of the model (met**re**s),
T = flight time of the model (seconds).

~~INT~~ **ABS** = ~~Integer~~ Absolute value function ~~in MS-Excel software~~

Reason: The text of Rule 6.2.5 specifies that the score of each flight shall be based

on the absolute values of the altitude difference and the duration difference. The proposed rule change makes the scoring formula consistent with the text of Rule 6.2.5.

PART EIGHT – BOOST/GLIDE DURATION COMPETITION (CLASS S4)

j) 8.1 Definition/Description **Space Modelling Subcommittee**
8.2 Purpose of Competition

SC VOTES:10/0/0
TM VOTES:10/0/0
For approval

Amend the paragraphs as shown below:

8.1 Definition/Description
This competition comprises a series of events open to any free flight space model that ascends into the air without use of lifting surfaces which sustain the entry against gravity during that portion of flight when it is being subjected to or accelerated by thrust from its space model engine; and that returns ~~its glider portion~~ to the ground in stable gliding flight supported by aerodynamic lifting surfaces which sustain the ~~portion~~ **model** against gravity. …

8.2 Purpose of Competition
… Each model will be timed from the instant of first motion on the launcher until the instant the ~~gliding top portion~~ model touches the ground.

Reason: Correction. According to SC4 Volume SM par. 2.4.7., S4 models must fly and land without separation of any part in flight. The wording in 8.1 and 8.2 is in contradiction with that and it is necessary to harmonize the rules.

SC VOTES:1/8/1
TM VOTES:10/0/0
For approval, amended

k) 8.1 Definition/Description **USA**

Amend 8.1 as shown below (this is a similar proposal to Item i) above). Add a new paragraph at the end of that paragraph and delete the radio control rule:

This competition comprises a series of events open to any ~~free flight~~ space model that ascends into the air without use of lifting surfaces which sustain the entry against gravity during that portion of flight when it is being subjected to or accelerated by thrust from its space model engine; and that returns ~~its glider portion~~ to the ground in stable gliding flight supported by aerodynamic lifting surfaces which sustain the ~~portion~~ **model** against gravity. The intent of this competition is to provide a sporting competition for space models with gliding recovery. Space models that ascend into the air in a spiralling climb under rocket power in such a manner that they are supported during their rise by wings shall not be eligible for entry in this competition.

The model may use one channel of radio control to control a single function (~~rudder, elevator, flaps~~, dethermaliser, etc.). All models shall use spread spectrum 2.4 GHz radio systems to eliminate the need for transmitter impound.

Any model that qualifies as a flex-wing (Rogallo) rule 13.1.1 is not eligible for this event.

~~Any model that qualifies as a radio controlled model rule 11.5 is not eligible for this event.~~

Reason: Allowing one channel of radio control will increase the technical challenge of the event. It will also help recover models and minimise the loss of models.

SC VOTES:6/1/3
TM VOTES:1/9/0
Withdrawn

PART NINE – SCALE COMPETITION (CLASS S7)

l) 9.9. Maximum Weight and Impulse **Space Modelling Subcommittee**

Delete the existing three sentences and insert replacement sentences as follows:

~~Maximum allowable gross launching weight is limited to 1500 grams.~~
~~Maximum allowable total impulse is 160,00 Newton-seconds.~~
~~Maximum engine size allowed is 80Newton-seconds.~~

Maximum allowable gross launching weight is limited to 2000 grams.
Maximum allowable total impulse is 240.00 Newton seconds.
Maximum engine size allowed is 100 newton seconds.

Reason: It will be possible to manufacture more copies of the spectacular model that attracts a large number of space modelers. Space Modelling will become more attractive and understandable to the spectators and sponsors.

SC VOTES:7/0/3
TM VOTES:10/0/0
For approval

m) 9.11.1 Scale Judging **USA**
Annex 1 Scale Judging – Prototype Drawings

Remove the requirement that the workshop drawing be 1:1 to the scale model:

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~~ **that shows prototype and model dimensions**
- 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.

Annex 1 (page 52)

- workshop drawing of scale model ~~- scale 1:1~~ **that shows prototype and model dimensions**

Reason: Very large models (up to two metres in height) are becoming popular in S7. For very large scale models, a 1:1 workshop drawing is too large for practical use during static judging. In addition, these large drawings are difficult and expensive to print. A smaller workshop drawing is more practical to use during judging.

SC VOTES:3/3/4
TM VOTES:Agreed
To SM/SC

n) 9.11.4. Degree of difficulty **Space Modelling Subcommittee**

Amend the paragraph as shown below:

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; **and** 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.

Reason: In the last years too many flights at World and European Championships ended by DQ, only because the scale model was not stable enough. The main reason is to achieve points for flyability. By deleting this term, modellers will be encouraged to build their models more stable, and will improve the attractiveness of this event.

o) 9.11.4. Degree of difficulty **USA**

SC VOTES:5/3/2
TM VOTES: 7/0/3
For approval

Include the addition as shown at the end of the paragraph:

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. **For originality points, prototypes with the same external appearance except for flight serial number/markings and colours/paint pattern shall not be considered unique vehicles (e.g., Saturn IB/Skylab flights, Soyuz-FG/TMA flights, etc.).**

Reason: Clarify the definition of 'originality'. The purpose of the originality bonus points is to encourage more diversity in the S7 prototypes entered. However, the current definition of unique prototype is not well defined. The purpose of the rule change is to clarify that having two or more prototypes that are identical except for serial number (and related markings and paint pattern) do not qualify as unique prototypes.

SC VOTES:7/0/3
TM VOTES: 7/0/3
For approval

p) 9.11.7 (new) **USA**

Add a new rule 9.11.7 regarding the publication of results as follows:

9.11.7. Results for static points and flight characteristics shall be published for the categories defined in Rules 9.11.2 through 9.11.4:

Adherence to Scale
Workmanship
Degree of Difficulty

Flight Characteristics

For World and Continental Space Modelling Championships, the judging scores from each judge shall be anonymously published.

Reason: In order for scale modellers to improve their models, it is important to get information and feedback from the judging process. Publishing a breakdown of the static and flight judging categories will provide helpful information.

q) 9.12 **USA**

SC VOTES:4/3/3
TM VOTES: 6/0/3
For approval

Amend paragraph 9.12 as shown below:

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~~ **score shall be zero**.

Reason: Currently, rule 9.12 permits a scenario where a model can receive a score (equal to its static scale points) even though the model has not demonstrated that it can make a stable, qualified flight. This could affect event results for individuals and teams. For safety, a model should be required to make a qualified flight.

PART ELEVEN – ROCKET GLIDER DURATION COMPETITION (CLASS S8)

r) 11.1. General **Switzerland**

SC VOTES:9/0/1
TM VOTES: 9/0/0
For approval

Add a new paragraph 11.1.3 with text as follows:

11.1.3 Radius of the nose must be a minimum of 5 mm in all orientations for S8D, S8E, S8E/P, S8F

Reason: Safety.

SC VOTES:3/6/1
TM VOTES: Agreed
Withdrawn

s(i)) 11.6. Sub-Classes **Space Modelling Subcommittee**

Change wing span, weight and total impulse of the engine as shown in the tables below:

11.6. SUB-CLASSES

CLASS	TOTAL IMPULSE (Newton-seconds)	MAXIMUM WEIGHT (g)	MINIMUM WING SPAN (mm)	MAXIMUM FLIGHT TIME (sec)
S8A	0,00 -2,50	60	500	180
S8B	2,51- 5,00	90	650	240
S8C	5,01- 10,00	120	800	300
~~S8D~~	~~10,01- 20,00~~	~~300~~	~~950~~	~~360~~
~~S8E & S8E/P~~	~~20,01 -40,00~~	~~300~~	~~1100~~	~~360~~
~~S8F~~	~~40,01 80,00~~	~~500~~	~~1250~~	~~360~~

11.6. SUB-CLASSES

CLASS	**TOTAL IMPULSE (Newton-seconds)**	**MAXIMUM WEIGHT**	**MINIMUM WING SPAN**	**MAXIMUM FLIGHT TIME**

		g)	(mm)	(sec)
S8A	**0.00 -2.50**	**60**	**500**	**180**
S8B	**2.51- 5.00**	**90**	**650**	**240**
S8C	**5.01- 10.00**	**120**	**800**	**300**
S8D & S8E/P	**10.01- 20.00**	**300**	**1200**	**360**
S8E	**20.01- 40.00**	**400**	**1500**	**480**
S8F	**40.01 80.00**	**500**	**1500**	**480**

Reason: Reduction of total impulse of the engine (s) and the increase in wing span and improve the observability of the glider will make the class attractive for spectators and sponsors.

Technical Secretary's Note: See also the next item s(ii)) regarding the same paragraph.

s(ii)) 11.6. Sub-Classes **Switzerland**

SC VOTES:4/5/1
TM VOTES: Agreed
Withdrawn

Change the dimensions:

CLASS	TOTAL IMPULSE (Newton-seconds)	MAXIMUM WEIGHT (g)	MINIMUM WING SPAN (mm)	MAXIMUM FLIGHT TIME (sec)
S8A	0,00 - 2,50	60	500	180
S8B	2,51 - 5,00	90	650	240
S8C	5,01 - 10,00	120	800	300
~~S8D~~	~~10,01 - 20,00~~	~~300~~	~~950~~	~~360~~
~~S8E & S8E/P~~	~~20,01 - 40,00~~	~~300~~	~~1100~~	~~360~~
~~S8F~~	~~40,01 - 80,00~~	~~500~~	~~1250~~	~~360~~
S8D	**10,01 - 20,00**	**300**	**1100**	**360**
S8E & S8E/P	**20,01 - 40,00**	**400**	**1300**	**360**
S8F	**40,01 - 80,00**	**500**	**1480**	**360**

Reason: Safety. New models modified from DLG Gliders goes very high up, bigger span reduce this. The new weight for S8E & S8E/P allows to fly any DLG Glider.

SC VOTES:5/3/1
TM VOTES: Agreed
Withdrawn

t) 11.7.2. Specifications **Space Modelling Subcommittee**

Replace the first sentence to change the total impulse to agree with the table of sub-classes above:

11.7.2. SPECIFICATIONS
~~The competition has only one subclass determined for models which comply with subclass S8E. Total impulse of engine(s) 20,01 to 40,00 is allowed.~~
The competition has only one subclass determined for models which comply with subclass S8D. Total impulse of engine(s) 10,01 to 20,00 is allowed.

The radio shall be able to operate simultaneously with other equipment at 20 kHz spacing. Where the radio does not meet this requirement, the working bandwidth (Maximum 50 kHz) shall be specified by the competitor.

Reason: Reducing the total impulse the motor(s) observability gliders for judges and will return "sportiness" in this class of models. Since this is an existing total impulse H c 40 show results in 360 seconds does not seem a daunting task.

u) 11.7.2. Specifications **Switzerland**

SC VOTES:9/0/1
TM VOTES: 9/0/0
For approval

Amend the second paragraph as shown below:

The radio shall be able to operate at **2.4 GHz** ~~simultaneously with other equipment at 20 kHz spacing~~. Where the radio does not meet this requirement, shall be specified by the competitor.

Reason: Now the 2.4 GHz radios are state of art, this make the competition more easy.

SC VOTES:7/2/1
TM VOTES: 9/0/0
For approval

v) 11.7.4.6. Timing and Classification ing Subcommittee

Delete the first paragraph in 11.7.4.6., replacing it with the new text as shown below:

11.7.4.6. Additional points will be awarded for landing:

~~When the nose of the model comes to rest within one metre of the centre of the designated landing circle, 100 points will be given. 10 points are deducted from the maximum of 100 points for every further metre from the centre. If the nose of the model lands between marks it is the lower of the marks that counts.~~

When the nose of the rocket-glider comes to rest, the distance from the nose to the centre of the circle is measured. One (1) point is deducted from a maximum of 100 points for every 10 centimetres from the centre.

Reason: This scoring system differentiates the skill of the pilot, and does not allow the athletes in one group receiving 1000 points.

SC VOTES:4/5/1
TM VOTES: Agreed
Withdrawn

w) 11.7.4.8. Timing and Classification Subcommittee

Add the text to the second sentence as follows:

11.7.4.8. The winner of a particular flight in the relating group receives a score of 1000 points. Other competitors receive points as follows **(fractions to be rounded to 1/100)**:

Reason: Fractions of points are needed in order to avoid ties or even a wrong classification.

Technical Secretary's Note: See also the next item x) regarding the same paragraph.

SC VOTES:8/1/1
TM VOTES: Agreed
For approval

x) 11.7.4.8. Timing and Classification Switzerland

Add new text to the second sentence as follows:

The corrected score shall be recorded (rounded) to one place after the decimal point.

Reason: Clarification.

SC VOTES:7/2/1
TM VOTES: 7/1/0
For approval

y) 11.7.4.9. Timing and Classification Switzerland

Amend text in the first sentence as follows:

The five competitors with the highest scores after ~~three~~ **four** starts qualify for the final round.

Reason: The competitors want to fly more.

SC VOTES:7/2/1
TM VOTES: Agreed
For approval

z) 11.7.4.11. (new) **USA**

Add new rule 11.7.4.11. to increase the number of rounds for World and Continental Championships:

11.7.4.11. For Continental and World Championships, the number of initial rounds may be increased from three to five. The number of final rounds may be increased from one to two. The number of rounds shall be declared in the pre-contest bulletins.

Reason: As noted by Gerhard Wöbbeking[1], S8 classes "are very nice to watch and their launches are spectacular, not at least because of the comparable high engine power." Mr. Wöbbeking recommended increasing the number of initial rounds from three to five. This increase, along with increasing the number of final rounds, will reward contestants that have excellent and consistent skills.

[1] Wöbbeking, Gerhard, "Remarks on the EuCh for Space Models 2015", October, 2015.

aa) 11.7.5.3 Organisation of Starts **Switzerland**

SC VOTES:5/3/1
TM VOTES: Agreed
For approval

Amend the first sentence as shown below:

Each group of competitors has ~~14~~ **12** minutes of working time to ~~collect transmitters from the official,~~ perform an official flight ~~and return the transmitters to the official~~. In the case of the working time being exceeded (a delay in ~~returning the transmitter to the official~~ **landing**), the competitor will be disqualified for the round.

Reason: With 2.4 GHz radios we need not return the transmitter, so we can reduce the working time.

Technical Secretary's Note: See also the next item ab) regarding the same paragraph.

ab) 11.7.5.3 Organisation of Starts **g Subcommittee**

SC VOTES:5/4/1
TM VOTES: Agreed
Withdrawn

Amend the first sentence as shown below:

Each group of competitors has ~~14~~ **10** minutes of working time to ~~collect transmitters from the official,~~ perform an official **flight** ~~and return the transmitters to the official~~. In the case of the working time being exceeded (~~a delay in~~ ~~returning the transmitter to the official~~ **i.e. if the model lands after expiry of working time**), the competitor will be disqualified for the round.

Reason: Now almost all pilots use spread spectrum 2.4 GHz RC radio devices. See SC4 Vol SM 4.7.5: "When all the RC radio devices are spread spectrum 2.4 GHz, they must not be impounded." If anyone will use other devices, will be receiving the transmitters during the preparing time and to take off after the end of working time.

Reducing working time to 10 minutes, because they do not need to take on and off

the transmitters in during working time, as well as enhanced competition and reducing the time of the competition.

ac) 11.7.5.4 Organisation of Starts **Switzerland**

SC VOTES:5/0/3
TM VOTES: Agreed
For approval

Delete the text as shown below:

In normal situations the circles will overlap each other but the centres should never be closer than ~~5 metres apart. In normal practice, the circle centres should be~~ 10 metres apart as in the diagram above. A competitor (pilot) and one helper may stay at the landing area either inside or outside the landing circles.

Reason: Safety.

SC VOTES:5/1/4
TM VOTES: Agreed
For approval

Annexes

ad) Annex 1 – Scale Space Models Judge's Guide Space Modelling Subcommittee

In the Table of Judging Considerations, delete the term 'Staging' and add the term 'Powered Separation' as shown below:

Flight Characteristics	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-minus)____
	Powered separation	**Up to 30 points for realistic powered separation of a powered portion of a model (capsule, stage, powered spacecraft, etc.) in accordance with paragraphs 2.3.1., 2.3.2. and Annex 2- 4.d.2.**	**(0-60)____**

Reason: Models like little Joe 1 are 'penalised' in flight points, because they do not have a second and/or third stage, although they do have a powered part (in this case the capsule). By launching the capsule as an effect, the competitor loses automatically a minimum of 15 points by performing the same as (for example) someone who launches a Nike-Tomahawk and receives 30 points whether the flight was stable or not. Also this rule change will not only make more prototypes competitive, but it will stop the discussions about whether a powered rocket part is or isn't a second or third stage.

ae) Annex 1 – Scale Space Models Judge's Guide Space Modelling Subcommittee

In the Table of Judging Considerations, change the range of points in the sub-categories 'External Components' and 'Detailing'. Delete the sub-category 'Flyability.

SC VOTES:7/0/3
TM VOTES: Agreed
Withdrawn

Degree of Difficulty	External Components	Consider the number and complexity of the entry's external components including fins, transitions, interstage adapters, shrouds, strapon booster, launch lugs, antennae, etc. Also consider to what extent the aforementioned components were prefabricated by none other than the entrant.	**(0-30)** ~~(0-20)~~
	Detailing	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.	**(0-30)** ~~(0-20)~~
	Paint Pattern	Consider the number of colours and complexity of the entry paint 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.	(0-20)
	~~"Flyability"~~	~~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.~~	~~(0-30)~~

Reason: In the last years too many flights at World and European Championships ended by DQ, only because the scale model was not stable enough. The main reason is to achieve points for flyability. By deleting this term modelers will be encouraged to build their models more stable, and will improve the attractiveness of this event. By adding more points to the subclasses "External Components" and "Detailing", the competitors have the motivation to build more accurate scale models.

SC VOTES:7/0/3
TM VOTES: Agreed
For approval

af) Annex 1 – Scale Space Models Judge's Guide Space Modelling Subcommittee

In the Table of Judging Considerations, change the range of points in the sub-category 'Configuration'.

FAI CATEGORY	SUB-CATEG.	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~~ **20**)

Reason: The Total of the Category is 150 points and not 160, so one Sub-Category needs to be reduced by 10.

SC VOTES:6/0/4
TM VOTES: Agreed
For approval

ag) Annex 2 – Space Modelling J Space Modelling Subcommittee Organisers Guide

In Paragraph 4. Specific Effects, change sub-paragraph d.2 as shown below:

Flight Characteristics - Special Effects **and Powered Separation**: 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 and/or powered separation** by relevant technical data. How many points to award for several special effects? Compare the degree of difficulty of four booster separation to smoke before lift off!

Reason: Clarification to the proposition of adding the term “powered separation” by deleting “staging”.

SC VOTES:5/0/5
TM VOTES: Agreed
For approval

ah) Annex 2 – Space Modelling Judge's and Organisers Guide **Space Modelling Subcommittee**

In Paragraph 4. Specific Effects, add sub-paragraph d.5 as shown below:

d.5. Definition of a scale model prototype: A scale model prototype is defined as the first sub-class of a rocket family (according to NASA and Wikipedia this is defined as version). For example : Ariane is the name of a rocket family, which has flown five variants up to date, thus: Ariane 1, 2, 3, 4 and 5. These five variants are defined as scale model rocket prototypes.

Reason: The rules are missing a direct definition what is a prototype. This add will clarify also the discussions regarding points for “Originality”.

ai) Annex 2 – Space Modelling Judge's and Organisers Guide **Bureau**

SC VOTES:10/0/0
TM VOTES: 9/0/0
For approval

In Paragraph 5. Organisers' Tasks, replace sub-paragraph b.2 with the paragraph as follows:

b.2. Electronic altitude measurements with an electronic altimeter shall use the new Sporting Code Volume EDIC – Electronic Devices in Competition – Section 2 - Technical Guidance Notes and Technical Specification for Altimeters Used in Space Modelling Competition V.1.0 for the documentation regarding specifications and guidance.

Reason: Electronic devices to be used in Space Models FAI international competitions must be treated in the same way as those used in other categories with detailed specifications, instructions for use and also for their technical testing to be put on the list of devices, which satisfy all demands for each category. Therefore CIAM Bureau established a specialized EDIC WG to deal with technical aspects of electronic devices and all on electronic devices shall be collected in a separate EDIC Volume of the FAI Sporting Code Section 4.

aj) Annex 3 – Space Models World Cup **Switzerland**

SC VOTES:10/0/0
TM VOTES: 9/0/0
For approval

In Paragraph 4. Points Allocation, amend the final sentence and add the new text as follows:

In the event of a tie for any placing, all competitors with that placing receive the number of points appropriate to that placing, ~~rounding up the score to the nearest whole number of points.~~ **The corrected score shall be recorded (rounded) to one place after the decimal point.**

Reason: Clarification