# 14.7 Section 4C Volume F2 – Control Line

## F2A – Control Line Speed

**a) 4.1.17 Timing** **Slovak Republic**

*Clarify by the addition of a sub paragraph c):*

**c) Immediately after finishing the actual flight, the competitor or the team manager can ask for the complete time sheet (including the times of each lap) or after finishing the round (the flights that day), the team manager(s) on request, will be provided with complete time sheets (including the times of each lap).**

Reasons: As the electronic timing systems allows to provide detailed overview of entire flight - lap by lap, and at the last actual European Championships it was very positively received, when the organizer provided these time sheets for each individual team manager and or pilot on request.

The background was, on requests from pilots to get detailed time information of the particular flight.

## F2B – Control Line Aerobatics

**b) 4.2.2 Characteristics of an Aerobatic Model Aircraft** **Italy**

*Delete sub-paragraph 4.2.2 e):*

~~e) The use of a pilot activated power shutdown device to define the point of the beginning of the power-off descent in the landing manoeuvre is not permitted.~~

Reasons: In Section 4 General Rule Volume para B.1.2.2 Category F2 - Control Line Flight, d) the use of external termination device is authorized:

*d) For permanent shutdown of the engine(s), any device or system is permitted including the use of 2.4 GHz Spread Spectrum technology legal for use in the concerned country. The competitor will determine the suitability for use of the chosen system.*

*Technical Secretary Comment: The use of an external termination device is certainly authorized, but it should be pointed out that the purpose of 4.2.2 e) above, is* ***to prohibit its use to define the point of the beginning of the power-off descent in the landing manoeuvre****. Therefore, 4.2.2 e) is not contradicting CGR B.1.2.2 d) as is claimed.*

**c) 4.2.6 Noise Testing** **F2 Subcommittee**

*Delete all of 4.2.6 Noise Testing content and replace by:*

**a) If requested by the F2B Contest Director, or the Head Judge, or an FAI Jury member present at the contest site, the noise level of any competitor's model aircraft shall be officially measured. Such requests shall only be made during or immediately after an official flight and if, in the opinion of the official requesting the noise test, the model aircraft concerned seems to have a noise level higher than 96 dB(A) when measured at exactly 3 metres. All requests for an official noise test shall be made only to the F2B Contest Director who then shall arrange a noise test to be performed on the model aircraft in its unchanged flying condition. Measuring equipment used shall be calibrated and the limit must not be exceeded by more than 2 dB(A).**

**b) If the model airplane fails to pass the noise test, the scores received in the related official flight are nullified.**

**c) The pilot may ask for a second official noise test. If the noise is then found to be within limits the model airplane may be used for further official flights.**

**d) A model aircraft failing to pass the second official noise test will be banned from further flying at the contest.**

Reason: The F2B Working Group of the F2 Subcommittee notes that there have been virtually no exceedances of the currently applicable noise limits at World and Continental Class F2B Championships over the past 12 years. The F2B Working Group therefore recommends maintaining the existing noise limit and considerably simplifying the corresponding procedure.

The international F2B Working Group of the F2 SC has voted 6 For and 2 Against on this proposal.

**d) 4.2.11 Judging** **F2 Subcommittee**

*Amend sub-paragraphs l) and m) with the deletions and additions of the text shown, then add a new sub-paragraph n):*

l) All contest organisers shall arrange at least one judges' meal break per contest day. ~~If the judging panel/s request it, extra.~~ Further time shall ~~also~~ be scheduled for ~~additional~~ judges' breaks ~~(for example breaks of approximately 10 of approx.~~ of approximately 15 minutes duration at approximately 2 hour intervals throughout each round.

m) ~~In any contest,~~ **No** judge shall be scheduled ~~to judge more than 50 contest flights or~~ to perform a total of more than ~~10~~ **9** hours of judging duty ~~(whichever is the longer)~~ within any single contest day. This time shall include ~~the above judges'~~ calibration flight(s) **and briefings** but shall not include the breaks.

Add:

**n) Under extraordinary circumstances only, and with the unanimous approval of the judges' panel(s), the organiser may**

**extend the time limit of the judges' workload.**

Reasons: At World and Continental Championships in previous years, the large number of F2B participants has led to a very high daily workload for the judges. In order to limit the resulting risk of fatigue of the judges, the F2B Working Group of the F2 Subcommittee suggests to limit the daily working time of the judges and to prescribe obligatory rest breaks of sufficient duration.

The international F2B Working Group of the F2 SC has voted 5 For and 2 Against on this proposal.

**e) 4.2.15 Description of Manoeuvres F2 Subcommittee**

*In the manoeuvres listed below, make the replacement of text as shown. Note: If adopted, ANNEX 4B CLASS F2B – JUDGE'S GUIDE: 4.B.5 and 4.B.7 must be adapted accordingly. See Item g) below.*

| | |
|---|---|
| 4.2.15.4 Reverse Wing-over Manoeuvre | p 26 |
| 4.2.15.8 Two Consecutive Inside Square Loops Manoeuvre | p 27 |
| 4.2.15.9 Two Consecutive Outside Square Loops Manoeuvre | p 28 |
| 4.2.15.10 Two Consecutive Inside Triangular Loops Manoeuvre | p 29 |
| 4.2.15.12 Two Consecutive Horizontal Square Eights Manoeuvre | p 30 |
| 4.2.15.14 Hourglass Manoeuvre | p 32 |

**Replace**

Note: ~~All turns in this manoeuvre should be between 1.5 metres and 2.1 metres radius.~~

by: **All corners in this manoeuvre must be smooth, precise and shall be of a tight radius.**

Reason: The specification of a precisely defined turn radius value developed in the USA in the 1970's, has since then repeatedly led to substantially different assessments of the quality of turns by the judges. In 2018, the AMA rule in the USA was therefore changed as specified in this proposal. In the interest of a globally uniform regulation, an appropriate adaptation of the FAI rule is recommended.

The international F2B Working Group of the F2 SC has voted 11 For and 1 Against on this proposal.

**f) 4.2.15.16 Four-leaf Clover Manoeuvre F2 Subcommittee**

*Remove all sub-paragraphs describing this manoeuvre and replace with the text shown in **Annex 7c – F2B Four-leaf Clover Manoeuvre Description & Diagram**. In ANNEX 4J – CLASS F2B MANOEUVRE DIAGRAMS, remove the old diagram and replace with the diagram also shown in **Annex 7c**.*

Reason: Using accurate methods, it was proven that the current description and diagram of the manoeuvre is not compatible with the rules

of spherical geometry. To eliminate this contradiction from the Rule, the F2B Working Group of the F2 SC has adjusted both the description and the diagram. For flight safety reasons an optional alternate manoeuvre entry procedure was added at the same time.

The international F2B Working Group of the F2 SC has voted 16 For and 2 Against on this proposal.

**g) Annex 4B – F2B Judges' Guide** **F2 Subcommittee**

*In paragraph **4.B.5. General Comments on the Marking of Manoeuvres**, replace all of sub-paragraph g) with the text below and*

*In paragraph **4.B.7. Judging Subjective Errors**, replace all of sub-paragraph b).*

*This is as a consequence of the acceptance of Item f) - 4.2.15. Four-leaf Clover Manoeuvre above.*

**4.B.5. General Comments on the Marking of Manoeuvres**

g) ~~Recognition of "maximum 2.1 metres radius" as an abrupt change of direction with the resulting requirement for the model to fly the tightest (sharpest) possible corner (see also 4.B.8).~~

**g) Recognition of a turn in corners as an abrupt change of direction with the requirement for the model to fly the tightest (sharpest) possible corner (see also 4.B.7).**

**4.B.7 Judging Subjective Errors**

b) Turn radii

~~Similarly, judges should recognise that the intent of the manoeuvre descriptions regarding the radius of corners in manoeuvres such as square loop, square eight, triangle, etc, is that models should turn as sharply (tightly) as possible. Therefore, although it is not possible for judges to accurately measure whether a model has or has not made a turn of between 1.5 and 2.1 metres radius, the intent is clearly that models should turn as tightly as possible when making such turns. Therefore judges should award the highest marks to models turning the tightest (sharpest) corners (provided that the required line elevation angles and/or the required model pitch attitude has also been achieved), and they should award the lowest marks to models making the largest (softest) such turns~~.

b) Turn radii

**Judges should recognise that the intent of the Rule regarding corner radii in manoeuvres such as Square Loops, Square Eights, Triangles, etc. is that model aircraft should turn as sharply (tightly) as possible. Therefore judges should award the highest marks to model aircraft turning the tightest (sharpest) corners (provided that the required line elevation angles and/or the model aircraft's pitch angles have also been achieved) and**

**they should award the lowest marks to model aircraft making the largest (softest) such turns.**

Reason: Consequential change to adjust the rules to the rule change 4.2.15.16.

**h) Annex 4B – F2B Judges' Guide** **Italy**

*Delete the entire paragraph 4.B.12. Results Awareness and consequently renumber the following paragraphs.*

~~4.B.12. Results Awareness~~

~~In order to prevent influence of any kind, no judge should look at tabulated results scores and/or at contestants' "placing" until after the completion of a contest. Neither should judges discuss individual official flights, nor the execution of maneuvers; nor the marks awarded, nor the tabulated results (placing) or scores, with anyone at all during the whole contest. This includes discussions with the other judges, with any contestant, with any Team Manager, and with all spectators. The Head Judge should ensure that all members of the judging panel are aware of this requirement and that they all observe these requirements throughout the contest.~~

Reason: This requirement is obsolete, taking into consideration the social networks (e.g. Facebook, Twitter, Instagram, Whatsup,etc.) where the preliminary results are made available in real time, therefore it is quite impossible to avoid that a judge will not have access to the preliminary result.

We have to trust on the Judges' professionalism and fair behaviour that can be controlled through analysis of the score sheets.

**F2C – Control Line Team Racing**

**i) 4.3.1 Team Racing Event** **Italy**

*Amend the paragraph with the addition and deletion shown below:*

A team racing event is a contest where all races start with three model aircraft (hereinafter called 'the model') except when, in exceptional cases, a race may begin with two **models** ~~or one model(s)~~. The models are flown simultaneously in the same circuit, for a specified number of laps. …

Reason: Flying as a single pilot is not in the spirit of Team Racing Competition.

**j) 4.3.5 Team Racing Event** **Italy**

*Amend the sub-paragraph b) with the addition and deletion shown below:*

b) When a qualifying race does not contain three teams per rule 4.3.5.a), the judges shall ask for volunteers (from different nations in the case

of World or Continental Championships) to allow the remaining race to start with three teams.

If there are sufficient or more, volunteers for a qualifying race, the Judges shall conduct a blind draw to start the race with three teams and shall conduct a separate draw for the segment choice order. The volunteer team(s) shall not be eligible to have a time registered or to be granted a re-flight from this race.

If there are insufficient volunteers, the competing ~~team(s)~~ **teams** will be allowed to start the race **with ~~almost~~ 2 (two) teams** ~~fewer than three teams~~ to complete their qualifying or semi-final race.

Reason: Flying as a single pilot is not in the spirit of Team Racing Competition.

*Technical Secretary Comment: You can't have 'almost' two teams. Delete the word 'almost' or substitute with 'at least'. Consequence of previous proposal.*

**k) 4.3.3 Team Racing Model, Engine and Control System F2 Subcommittee**

*Amend the engine characteristics sub-paragraph 4.3.3.1 e) with the additional text shown below:*

4.3.3.1

e) The maximum exhaust outlet area is 60 $mm^2$ projected at the cylinder exhaust port or crankcase exhaust outlet whichever is smaller. If a silencer is used the exhaust outlet measurement is taken at the exhaust outlet end of the silencer**. The minimum length of a silencer (if used) must be 60mm and the minimum volume must be 15 $cm^3$.**

Reason: The current sporting code does not contain a definition for silencer measurements i.e. a 2 mm long silencer can be defined as a silencer. To avoid loopholes, a minimum length and volume must be added.

**l) 4.3.3 Team Racing Model, Engine and Control System France**

*Amend the model characteristics sub-paragraph 4.3.3.2 i) with the deletion and additional text shown below:*

4.3.3.2

i) The landing gear shall permit normal take-off and landing. ~~It may be retractable during flight, but must return to its extended position before landing.~~ **The only movement of the permanently extended leg that is allowed, is for shock absorption.**

Reason: The majority of top teams uses it, so the 0.3 sec speed difference per km is equal to all teams. The suppression of this highly

critical item will not be unfair to the top teams, but help new teams to come closer to them. This will help to make racing more attractive. Adding 0.3sec for 10 laps will help make races safer and easier to judge for the F2C Jury members. Building a model without retractable undercarriage is cheaper, easier and safer. It's a useless and expensive gadget that does not improve the classification, but makes the models more fragile in case of slightly hard landings. Makes progression to the top more difficult for new teams. Nowadays, a retractable undercarriage adds 200 to 350 Euros to the cost of the F2C models.

**m) New Annex – Annex 4N** **F2 Subcommittee**

*Add a new Annex 4N: F2C Engine Extra Air Intake Processing Guide that outlines a Method for Testing F2C Engine Crankcase Leakage. Refer to* ***Annex 7d*** *for the text of the Guide.*

Reason:

**Issue at hand**

When 3.0 mm venturi rule for F2C was applied effective January 1, 2015 as part of the noise suppression effort, this severely restricted the ability of the F2C engine to pump air into the crankcase, thereby reducing engine power output and associated noise level.

Concerns have been raised recently that competitors may be tempted to exploit ways to create a controlled air leakage path into the crankcase through the crankshaft to crankshaft interface. At the 2019 European Championships, the controls processing official detected an engine that appeared to have varying degree of leakage through the crankshaft interface as the crankshaft is being rotated. Without clear guidelines of what constitutes acceptable variation in leakage, the official requested for the engine to be disassembled including removal of the crankshaft. The Team Manager refused to comply, claiming concerns about risk of their technology being copied, and the competitor subsequently withdrew from the competition.

It is envisaged that there are a few possible ways to create a controlled air leakage path into the crankcase through the crankshaft to crankcase interface. These are difficult or impossible to be detected visually without removal of the crankshaft from the engine.

Since crankshaft removal is a very complicated undertaking at the competition field, a practical method for evaluating what constitute acceptable leakage at the flying field is needed, so that crankshaft removal is to be performed as a last resort.

***Examples of inexpensive DC 12V vacuum pumps available for purchase on eBay:***



**F2F – Control Line Diesel Profile** **Team Racing**

**n) Annex 4H: F2F Control Line Diesel Profile Team Racing** **F2 Subcommittee**

*Amend the paragraph 4.H.3.2 Model Characteristics b) shown below:*

4.H.3.2 Model Characteristics

b) Weight

i) Total maximum weight with empty tank is 700 g.

~~ii) Total minimum weight with empty tank is 400 g~~.

**ii) Total minimum weight with empty tank is 350 g.**

Reason: The competitors' existing models weigh average +360 grams. Due to the 400 g minimal weight limit the competitors need to load models to meet the current rule, which shall modify model characteristics.

**o) 4.H.4 Fuel** **F2 Subcommittee**

*Delete the entire paragraph and replace with the text shown below:*

**4.H.4 Fuel**

**No fuel restrictions.**

Reason: Any fuel substitutes (like lead) don't improve the performance anymore with the current engine (venturi) and propeller rule restrictions. Use of any fuel mixture will simplify organiser tasks.

**p) 4.H.8 Definition of an Official Flight** **F2 Subcommittee**

*Delete the note as shown below:*

a) An official flight is completed when the conditions in 4.H.7 are met.

~~Note: In F2F, finishing a race at less than 50 laps is allowed, because the objective of the race is not the time flown, but the position in the race.~~

Reason: None given.

**q) 4.H.6, 4.H.7 and 4.H.10 F2 Subcommittee**

*Delete existing rules as shown below:*

4.H.6. Organisation of Races
*delete the existing rules from* ~~4.H.6. a-e~~
*and replace by* **See 4.3.5.**

4.H.7. Race from Start to Finish
*delete the existing rules from* ~~4.H.7 a-b~~
*and replace by* **See 4.3.6.**

4.H.10.Classification
*delete the existing rules from* ~~4.H.10. a-h~~
*and replace by* **See 4.3.9.**

Reason: The new (2019) rules have resulted in high disinterest in the F2F category. All organisers have replaced the existing rules with the 2018 rules and flown the competitions during the 2019 calendar season with the old rules.

This resulted in cancellation of the F2F events from the World Cup ranking.

F2F class is an entry class of F2C; and classification and race definitions should meet the F2C definitions.

**F2G – Control Line Electric Speed**

**r) 4.K.2 Characteristics of an Electric Speed Model Aircraft Switzerland**

*Delete all of 4.K.2 and replace by the following:*

**4.K.2 Characteristics of a Speed Model Aircraft driven by electric motor(s)**

**a) Maximum off-load voltage of power supply 42 V**

**b) Maximum weight of battery (or batteries) 200 g (incl. battery cables and connectors**

**c) Minimum total projected area 5.0 $dm^2$**

**d) Maximum total projected area 6.0 $dm^2$**

**e) Maximum wing loading 100 $g/dm^2$**

**f) Maximum wingspan 100 cm**

***Note: To determine the wingspan of an asymmetric model aircraft refer to CIAM General Rules B.4.27 and regard one point being at the thrust line of the aircraft.***

**g) The model aircraft must take off from the ground.**

**h) For safety reasons a radio control system as defined by CIAM General Rules B.1.2.2 c) may be used to control the start of the**

**motor, in-flight power and the shutdown of the motor. A person other than the pilot may operate this system.**

**i) After shutdown the aircraft must be retained until its power system has been secured against accidental motor start.**

**k) An external manually operated device to disconnect the battery must be fitted to enable total shut-off of the power when the model aircraft is not airborne.**

**l) The pilot or a helper must connect the motor power battery to the ESC whilst preparing the model for flight inside the flying circle.**

***Safety Note: Whenever the battery is connected to the ESC the model aircraft must be either retained or the pilot must hold the handle in the centre of the flying circle.***

Reason: Based on experience gained throughout the period of provisional validity of the F2G rules, the suggested modifications are considered to be prerequisite for the future safe operation of control line electric speed model aircraft.

**s) 4.K.7 Definition of an Attempt — Switzerland**

*Amend the paragraph with the addition shown below:*

**4.K.7 Definition of an Attempt**

It is considered an attempt when the pilot does not engage the control handle in the pylon fork within 3 minutes after the starting signal. **It is also considered an attempt if the electric motor does not start within 3 minutes from the starting signal.**

**a) For electric speed model aircraft the starting sequence (signal) begins when the battery is connected to the ESC.**

Reason: Based on experience gained throughout the period of provisional validity of the F2G rules, the suggested modifications have been found to be useful for the future conduct of F2G contests.

**t) 4.K.8 Number of Attempts — Switzerland**

*Amend the paragraph with the addition shown below:*

**4.K.8 Number of Attempts**

In the case of an unsuccessful first attempt for an official flight, the competitor is entitled to a second attempt. **In accordance with the pilot, second attempts shall be scheduled to take place within the shortest possible time needed to re-establish flight condition.**

Reason: Based on experience gained throughout the period of provisional validity of the F2G rules, the suggested modifications have been found to be useful for the future conduct of F2G contests.