

**ANNEX 5L  
F3M - PROVISIONAL CLASS**

**5.L.1. CLASS F3M – LARGE AEROBATICS POWER MODEL AIRCRAFT**

**5.L.1.1. Definition of a Large Radio Controlled Aerobatics Power Model Aircraft**

Model Aircraft, but not a helicopter, which is aerodynamically manoeuvred by control surface(s) in attitude, direction and altitude by a pilot on the ground using radio control.

The Model Aircraft should be a model of a real aircraft able to perform aerobatics. The competitor should prove it by providing a dossier including a minimum of a three-view drawing and a photograph of the real aircraft.

**5.L.1.2. Definition of a competition for model aircrafts class F3M**

A competition for model aircraft class F3M is based on three tasks:

- One task on a known schedule, valid for two years.
- One task on an unknown schedule, this unknown schedule is given to each pilot before the task, without any possibility of training. The difficulty of this task will be equivalent to the known schedule.
- A free schedule according to the choice of the pilot.

**5.L.1.3. General Characteristics of a large Radio controlled Aerobatics Power Model Aircraft**

Minimum overall span for monoplanes .....2.1 m

Minimum overall span for biplanes .....1.8 m

Maximum Flying Weight without fuel .....20 kg

Paragraph B.3.1. of section 4b (Builder of Model Aircraft) is not applicable to class F3M

Power source limitations, Radio Equipment: See 5.1.2

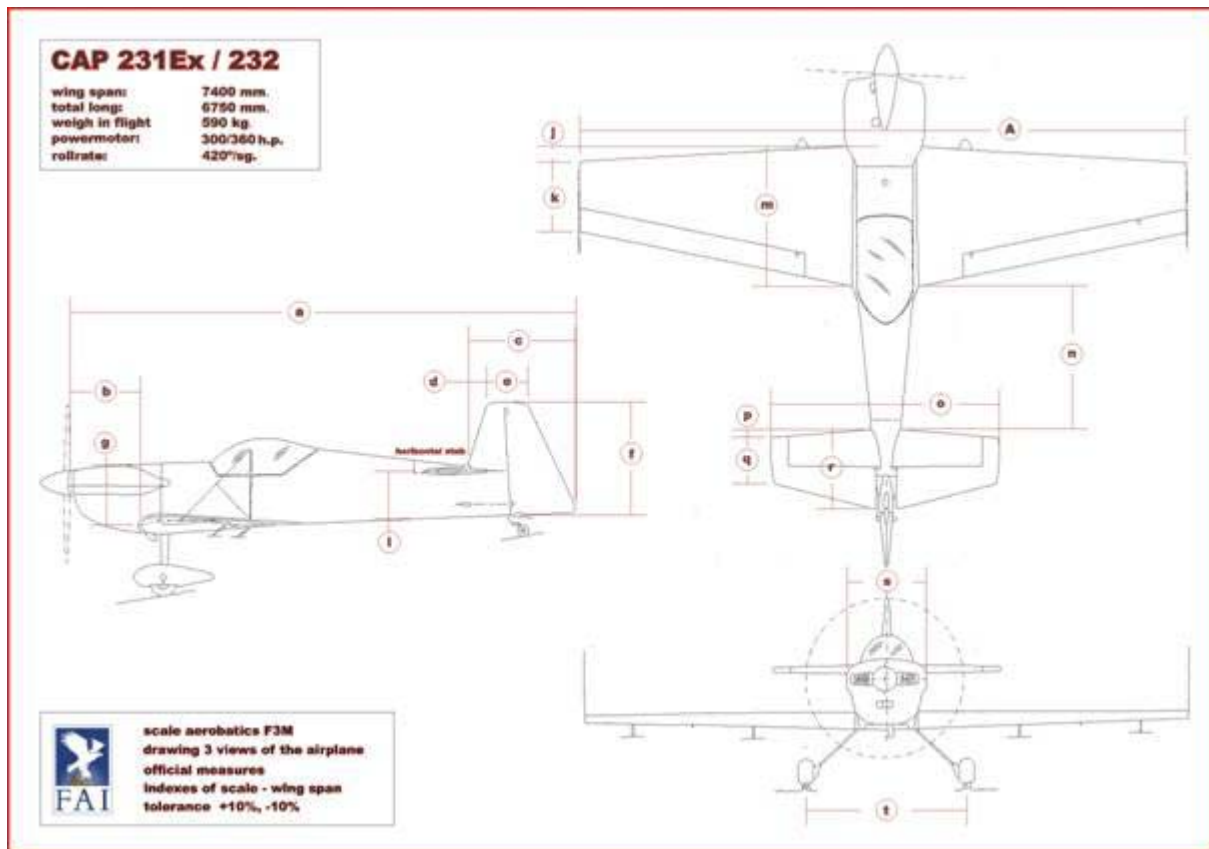
To be eligible for competing, the following documentation must be submitted to the judges at registration, before the start of the competition:

**a-** an accurate three view drawing of the subject aircraft (home made drawings by the competitor or other draftsman are not acceptable)

**b-** The dimensions are considered on the top view and side view of the subject aircraft.

**c-** The scale of the model aircraft is calculated from the wing span.

**d-** Dimensions described on the following drawing can be measured.



A Tolerance is allowed as followed :

**D** is the full size measure in cm, **s** is scale, **d** is model measure in cm :  
 $(D \times s) \cdot 0.9 - 0.5 \leq d \leq (D \times s) \cdot 1.1 + 0.5$

e- The area of control surfaces compared to fixed surfaces will not be considered.

Example: only outside dimensions of the wing, stabiliser and fin will be considered, not ailerons, elevator or rudder, but the concept of moving surfaces must be the same as on the subject aircraft. (aileron in two parts, moving part of the fin for

aerodynamic balance, trim are forbidden if not on the real aircraft.)

f- The competitor must be able to provide any technical data for technical checking. If the dimensions are not in accordance with the rules, the model aircraft is not allowed to fly and the competitor is disqualified.

g- The maximum noise level will be 94 dB(A) measured at 7 m from the centre line of the model aircraft with the model aircraft placed on the ground over concrete or macadam at the flying site. With the motor running at full power measurement will be taken 90 degrees to the flight path on the right hand side and downwind from the model aircraft. The microphone will be placed on a stand 30 cm above the ground in line with the motor. No noise reflecting objects shall be nearer than 7 m to the model aircraft or microphone. The noise measurement will be made prior to each flight. If a concrete or macadam surface is not available then the measurement may be taken over bare earth or very short grass in which case the maximum noise level will be 92 dB(A).

In the event a model aircraft fails the noise test, no indication shall be given to the pilot, and/or his team, or the judges and both the transmitter and the model aircraft shall be impounded by the flight line official immediately following the flight. No modification or adjustment to the model aircraft shall be permitted (other than refueling). The model aircraft shall be retested by a second noise steward using a second noise meter and in the event that the model aircraft fails the retest, the score for the preceding flight shall be zero.

The flight time will be interrupted while the noise check at the flying site is being made. The competitor shall not be delayed more than 30 seconds for the noise check

5.L.1.4. **Definition and number of helpers** : see 5.1.3

5.L.1.5. **Number of flights** : Each competitor have the right to a minimum of three official flights ( 1 known

schedule + 1 unknown schedule + one Free schedule)

5.L.1.6. **Definition of an attempt** : see 5.1.5.

5.L.1.7. **Number of attempt** : see 5.1.6.

5.L.1.8. **Definition of an official flight** : see 5.1.7.

5.L.1.9. **Marking:**

Each manoeuvre may be awarded marks, in whole number increments, between 10 and 0 by each of the judges during the flight. These marks are multiplied by a coefficient which varies with the difficulty of the manoeuvre. Any manoeuvre not completed shall be scored zero (0). Manoeuvres must be performed where they can be seen clearly by the judges. If a judge, for some reason outside the control of the competitor, is not able to follow the model aircraft through the entire manoeuvre, he may set the «Not Observed» (N.O.) mark. In this case, the judge's mark for that particular manoeuvre will be the average of the numerical marks given by the other judges. Centre manoeuvres should be performed in the centre of the manoeuvring area while turn around manoeuvres should not extend past a line 70 degrees left and right of centre. **Vertical height should not exceed 70 degrees**. Also, manoeuvres should be performed along a line of approximately 150 m in front of the pilots. Infractions to this rule will be cause for downgrading by each judge individually and in proportion to the degree of infraction. The manoeuvring area will be clearly marked with white vertical poles, a minimum of 100 mm in diameter and a minimum of 4m high, placed on centre and 70 degrees each side of centre on a line 150 m in front of the pilots. Flags and /or streamers of contrasting colour should be mounted on the poles to improve visibility. White (or contrasting) lines originating at the pilot's position and extending outward at least 50 m will also be used to mark the centre and extreme limits (70 degrees left and right of centre) of the manoeuvring zone. Audible and visual signals to indicate violations of the manoeuvring zone are not to be employed.

The judges shall be seated no more than 10 m , and not less than 7 m behind the pilot's position ( the apex of the 70 degrees lines) and within an area described by the extension of the 70 degrees lines to the rear of the pilot.

At the conclusion of the flight each judge will independently consider if the in-flight noise level of the model aircraft is too noisy. If a majority of the judges consider the model aircraft too noisy, the flight score will be penalised 10 points for each counting judge.

If a model aircraft is in the opinion of the judges unsafe or being flown in an unsafe manner, they may instruct the pilot to land.

The scores given by each judge for each competitor shall be made public at the end of each round of competition.

5.L.1.10. **Classification** :

Classification will be done considering the sum of the three scores, known, unknown and free.

In the case two flights of each schedule have been completed, the sum of the best known and the best unknown scores will be considered.

In the case three flights have been completed, only the best score of the repeated flight (known or unknown will be added to the single other flight score.

Example: 1known and 2 unknown have been completed. Adding the «known» score to the best score of the 2 «unknown» flights will be considered to make the classification.

If possible, two free style flights (on the same or different schedule) will be performed, the best score is to be considered.

The final classification will be done by the sum of the 3 considered flight scores in each category multiplied by the following coefficients:

Known..... 35%

Unknown..... 45%

Free ..... 20%

1000 Points will be given to the pilot obtaining the highest total for his three retained flight scores.

The scores are then normalised to 1000 points as described below:

$Points\ x = Sx/Sw * 1000$

Points  $Sx$  = Points given to competitor  $x$

$Sx$  = Score of Competitor  $x$

$Sw$  = Score of Winner

The TBL system is not to be applied at the moment. As soon as possible, the organizers of competitions in this class may start to use a special program using the TBL system.

#### 5.L.1.11. Judging :

The criteria of judging for manoeuvres to be applied in this class are strictly identical to class F3A.

However, the judges will have to consider the dimensions and inertia of the model aircrafts. The manoeuvres are to be flown slower than with F3A model aircrafts, but should be more realistic.

The organiser must appoint a panel of five judges. For each manoeuvre only three marks are to be counted, the lowest and the highest marks have to be discarded.

#### 5.L.1.12. Organisation for Large Radio Control Aerobatic Model Aircrafts Contests

For transmitters and frequency control, see section 4b, paragraph B.8.

The draw for flight order will be done for the first task (known, unknown or free), for the following tasks the flight order will start at  $\frac{1}{4}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$  of the list.

During the flight, the competitor must stay in the proximity of the judges and under the supervision of the Flight Line Director.

Competitors must be called at least five minutes before they are required to occupy the starting area.

If his frequency is clear, the competitor will be given his transmitter when he occupies the starting area so that he can perform a radio check. He will have to watch the model in flight at this moment to be sure not to disturb it.

If there is a frequency conflict he must be allowed a maximum of one minute for a radio check before the start of the 3 minute starting time. The timer will notify the competitor when the minute is finished and immediately start the 3-minute starting time.

#### 5.L.1.13. Execution of manoeuvres

The manoeuvres must be executed during an uninterrupted flight in the order in which they are listed. The competitor may make only one attempt at each manoeuvre during the flight. The pilot has three minutes to start his motor and eleven minutes to complete his flight; both the three minutes and the eleven minutes to start when the competitor is given permission to start his motor.

The model aircraft must take-off and land unassisted, that is, no hand launched flights. If any part of the model aircraft is dropped during the flight, scoring will cease at the point and the model must be landed immediately.

The direction of the manoeuvres is given by the heading of the model aircraft during the take-off.

The flight ends when the landing sequence is completed.

Scoring will cease with the expiration of the eleven-minute limit time.

The competitor must land the model immediately after the schedule has been completed and the model aircraft is then allowed to fly only once in front of the judges. If more, the competitor will lose the landing points.

The model aircraft must be landed in the landing area defined by a 50 meters diameter circle or within two lines marked on the runway and separated by 100 meters if the runway is larger than 10 meters .

The landing point is considered as the first point where the model aircraft touches the ground.

Landing out of the landing area, or a crash is noted zero (0).

The landing sequence is ended when the model aircraft has run for 10 m or is stopped.

#### 5.L.1.14. Schedules of manoeuvres .

a- The «known» schedule is valid for a two years period.

**b- Known and unknown schedules must use patterns according to the full size FAI Aresti catalogue."**

The «unknown» schedule is given to the competitors in the evening preceding the competition day, or in the morning of the competition day with no possibility of training. In case of training on the «unknown» schedule, the competitor must be disqualified.

This schedule must be completely new, unknown and not more difficult than the «known» schedule.

For each manoeuvre, judges and competitors must refer to the F3A rules which define all manoeuvres and errors to be avoided. The same criteria of judging are to be used for dimensions of manoeuvres (70° on each side and about 150 m in distance).

Before the beginning of the task with the unknown schedule, the chief judge will brief the judges and the competitors to clearly define the different manoeuvres expected from the pilots.

The knowledge of the Aresti system is highly recommended to the pilots and the judges.

c- «Free Style» schedule:

Free Style schedules gives to the competitor the ability to demonstrate his own skill and the qualities of his model aircraft. The rules for the manoeuvres are not mandatory, however, safety remains.

The model aircraft flown by the competitor may be different from the one flown for the two other schedules provided this model aircraft conforms to the general characteristics of F3M class.

The maximum duration of this flight is five (5) minutes after the take-off signal. The competitor will be notified at one minute before the end of the five-minute period.

After the end of the five-minute period, the manoeuvres are no more considered by the judges.

If the model aircraft is still airborne, it must be landed immediately otherwise scoring might be heavily penalised.

## **Free Style» schedule:**

### **1. - Marking Criteria**

The Free style task includes 5 criteria they are grouping in three groups.

- Principal group

- TECHNICAL K=30
- ARTISTIC K=30

- Penalization group (the K coefficient is negative)

- POSITIONING K=-10
- SECURITY K=-20

These two groups are giving marks during the flying.

- The latest criteria is giving marks at the end of flying.

- GENERAL IMPRESSION K=30

Every criteria score is multiplied by K coefficient

### **2. - Judge Criteria Score**

#### **TECHNICAL**

The initial point for the criteria is 10 points and the judges are increasing or decreasing depending the technical execution through the flying of the figures.

- For the executed bad or very bad figure the score will be decreased 1 or 2 points.
- For the correctly executed figure not increase or decrease the score.
- For the figure executed well or very well the score will be increased 1 or 2 points.
- The minimum score will be 0 and there is a not maximum point.

At the end of the flights, the scores is then normalized to 10 points for every judge. Individual for every judge. The best score pilot in this criteria is 10 points and the other pilots are proportional.

#### **ARTISTIC**

The initial point for the criteria is 10 points and the judges are increasing or decreasing depending the figure choreography through the flying.

- For the bad or very bad figure choreography the score will be decreased 1 or 2 points.
- For the correct figure choreography not increase or decrease the score.
- For the good or very good figure choreography the score will be increased 1 or 2 points
- In the flying that is not flying with music the score will be 0
- The minimum score will be 0 and there is a not maximum point

At the end of the flights, the scores are then normalized to 10 points for every judge. Individual for every judge. The best score pilot in this criteria is 10 points and the other pilots are proportional.

## POSITIONING

The pilot will begin with 0 points and the judge will penalize the bad use of the flight window.

There are a maximal of 10 points of penalized.

## SECURITY

The pilot will begin with 0 points and the judge will penalize the insecure execution of the flight.

For the 1st violation of the security line (20 m) the score will penalize in 5 points.

There are a maximal of 10 points of penalized.

For de 2nd violation of the security line (20 m) all the flight is "0"

## GENERAL IMPRESSION

The judge will evaluate the general result of the flight, the quality, the harmony and the correct use of special effects.

The judge will be marking between 0 and 10.

### 3.-Penalize by Time

The duration of the flight in the free program will be from 4 to 5 minutes and the incomplete flights will be penalized according to this chart:

0 to 1 minute the total flight score is "0"  
1 to 2 minutes 75 % penalize total flight score  
2 to 3 minutes 50 % penalize total flight score  
3 to 4 minutes 25 % penalize total flight score  
4 to 5 minutes 25 % penalize if the flight is off by model failure.

## KNOWN PROGRAM

### Known schedule manoeuvres

Nr	Description	K factor
	Take-off sequence	6
1	Cuban eight, two points roll in first leg, 2/4 points roll in third leg	43
2	Inverted split-S	13
3	One negative snap roll, 3/2 points roll opposite	27
4	Pull push pull humpty bump, 3/4 points roll up, 1-1/4 roll down	36
5	Rolling circle with 2 rolls reversed, first roll outside	28
6	Stall turn, 2/4 points roll up, 1-1/2 negative snap roll down	45
7	Z figure, 3/2 points roll	25
8	Half inverted reversed cuban eight, 2/4 points roll	16
9	1-1/2 inverted spin	14
10	+-- humpty bump, 1-1/4 positive snap roll up, 3/4 roll down	39
11	4/8 point roll, 3/2 point roll opposite	22
12	Half inverted square loop, one negative snap roll, 2/4 point roll opposite, one roll	45
13	Reversed loop, 1-1/2 positive snap roll	26
	Landing sequence	6

## DESCRIPTION OF FIGURES

### Take-off sequence :

The model aircraft is placed on the runway, takes off, then turns 90 degrees towards the line defined by the upwind and downwind marker. When approximately over this line the model aircraft turns 270 degrees for a downwind trim

pass. When approximately even with the downwin marker the model aircraft initiates a 180 degree turn, reversal, or other turn-around figure of pilot's choice.

Judging Notes:

- Take off sequence not followed, zero points.
- Model aircraft passes behind the judges line (zero line), zero points.
- Only two scores, a zero or a 10, may be awarded for the take-off sequence.

**fig 1.- Outside inside cuban eight from bottom, two points roll in first leg, straight line in second leg, 2/4 points roll in third leg, exit inverted :**

Pull to a 45 degree upline and perform a two points roll, then perform three fourth of an outside loop. On the second 45 degree inverted upline, perform a straight line followed by three fourth of an inside loop. On the third 45 degree upline perform a two points of a four points roll, then pull to recover inverted.

Judging Notes:

- Uplines must be 45 degree line.
- Uplines must cross over on their middle.
- Rolls must be placed on the middle of the 45 degree uplines.
- The uplines cross over point must be centered.
- Loops must be round.

**fig 2.- Inverted split-S, exit inverted :**

On a horizontal line perform a half roll immediately followed by a half outside loop. Exit inverted.

Judging notes:

- No hesitation between the half roll and the half loop.

**fig 3.- One negative snap roll, 3/2 points roll opposite :**

On a horizontal line perform a negative snap roll followed by a three points of a two points roll in the opposite direction.

Judging notes:

- Figure should project a straight horizontal line throughout.
- Snap roll and point roll must be in opposite directions.
- Snap roll and point roll must be separated by a hesitation.
- The whole figure must be centered.

**fig 4.- Pull push pull humpty bump, 3/4 points roll up, 1-1/4 roll down :**

Pull to a verticalupline and execute a three points of a four points roll then push through a half outside loop to a vertical downline. On the downline perform 1-1/4 roll, pull to recover upright.

Judging notes:

- Point rolls must be centered on the vertical legs.
- Entry and exit altitude need not to be the same.
- Replacement figure free in rolls directions (according to description).

**fig 5.- Rolling circle with 2 rolls reversed, first roll outside :**

From a horizontal flight perform a rolling circle with two rolls, the first roll to the outside and the second roll to the inside.

Judging notes:

- Roll rate must be constant.
- Immediate reversal.

- Constant radius of circle (i.e. circle is wind corrected).
- Entry and exit must be at the same point.
- Figure should be downgraded if the circle is too large and too far out.
- Figure must be centered.

**fig 6.- Stall turn, 2/4 points roll up, 1-1/2 negative snap roll down :**

Pull to a vertical upline and execute two points of a four points roll then perform a stall turn to a vertical downline. On the downline perform 1-1/2 negative snap roll, pull to recover upright.

Judging notes:

- Point roll and snap roll must be centered in vertical legs.
- Stall turn must not be larger than 1-1/2 model aircraft wing span.

**fig 7.- Z figure, 3/2 points roll :**

Pull to a 135 degree upline and execute three points of a two points roll then pull to recover inverted.

Judging notes:

- Upline must be at 135 degrees.
- Point roll must be centered on the 135 degree upline.
- Figure must be centered.

**fig 8.- Half inverted reversed cuban eight, 2/4 points roll :**

Pull to a 45 degree downline, execute two points of a four points roll and pull to perform 5/8 of an inside loop to recover inverted.

Judging notes:

- Point roll must be centered in 45 degree downline.
- Inside loop must be round.
- Entry and exit altitude need not to be the same.

**fig 9.- 1-1/2 inverted spin :**

From an inverted horizontal line perform a 1-1/2 turn inverted spin then pull to recover upright.

Judging notes:

- Spin entry must not be a snap roll.
- Spin is followed by a straight vertical downline.

**fig 10.- Pull push push humpty bump, 1-1/4 positive snap roll up, 3/4 roll down :**

Pull to a vertical upline and execute 1-1/4 positive snap roll then push through a half outside loop to a vertical downline. On the downline perform 3/4 roll, push to recover inverted.

Judging notes:

- Snap roll and point roll must be centered on the vertical legs.
- Entry and exit altitude need not to be the same.
- Replacement figure free in rolls directions (according to description).

**fig 11.- 4/8 point roll, 3/2 point roll opposite :**

From an inverted horizontal line perform four points of a eight points roll followed by three points of a two points roll in the opposite direction. Exit inverted.

Judging notes:

- Figure should project a straight horizontal line throughout.
- Point rolls must be in opposite directions.
- Point rolls must be separated by a hesitation.
- The whole figure must be centered.

**fig 12.- Half inverted square loop, one negative snap roll, 2/4 point roll opposite, one roll :**

Push to a vertical upline and execute a negative snap roll followed by two points of a four point roll in the opposite direction then pull to an inverted horizontal line. On the inverted horizontal line perform a roll. Exit inverted.

Judging notes:

- Snap roll and point roll must be separated by a hesitation and in opposite direction.
- Snap roll and point roll must be centered in vertical upline.

**fig 13 .- Reversed loop, 1-1/2 positive snap roll :**

Perform half of an inside loop immediately followed by 1-1/2 positive snap roll immediately followed by a half of an outside loop. Exit upright.

Judging notes:

- Loop must be round.
- Snap roll must be centered.
- Half loops and snap roll must not be separated by hesitations (no straight line).
- Entry end exit must be at the same point.

**Landing sequence :**

At reduced power execute a 180 degree level or descending turn to a downwind heading. Fly a downwind leg, then turn 180 degrees into the wind. Fly a descending approach to the runway touching down in the landing zone. The landing sequence is completed when the model aircraft has either rolled 10 meters or comes to rest.

Judging notes:

- Model aircraft does not follow landing sequence, zero point.
- If any landing gear leg retracts on landing, zero point.
- If the model aircraft lands outside the landing zone, zero point. The landing zone is designated by a circle of 50 meters radius or lines across a standard runway spaced 100 meters apart where the runway is at least 10 meters wide.
- Only two scores, a zero or a ten, may be awarded for the landing sequence.