



# **BRITISH MODEL FLYING ASSOCIATION**

## **CONTEST RULES - SECTION 5**

### **R/C POWER**

**AEROBATICS**                      **HELICOPTERS**  
**PYLON RACING**                  **WATERPLANES**  
**SAM 35 VINTAGE**                **FUN-FLY**  
**DRONE (FPV) RACING**

**To be read in conjunction with the General Rules, Sections 1 and 2,  
which are available free of charge from the BMFA**

**Effective February 2022**

**Supersedes March 2021 Issue**

# SECTION 5 - R/C POWER RULES

## Contents

**Note:** FAI class rules for, F3A, F3P, F3M, F3S, F3C, F3N, F3D, F3R, F3T, F3X, and F9J are available for download at [www.fai.org/ciam-documents](http://www.fai.org/ciam-documents) or can be obtained from BMFA Head Office.

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### **Notes**

Any new or changed rule is marked with a side bar similar to the one at the side of this paragraph. Where rules are renumbered due to additions or deletions of rules then that renumbering is not side-barred

### **Gender**

Words of masculine gender should be taken as including all genders.

*Synopsis of Changes appears overleaf*

# Synopsis of 2022 Changes

Formatting corrected throughout the document and no side-bars

## **Aerobatic rule changes**

- 5.1 RC Aerobatics
- 5.1.1 General
- 5.1.2 Competition format
- 5.1.3 Manoeuvre Schedules

## **UKCAA rules**

- 5.1.8 Addition of rules – new entry to book

## **Helicopter rules**

- 5.4.2.3 One Day Contests
- 5.4.4.3 Flight Programme
- 5.4.4.4 Schedule of manoeuvres

## **E2K and C32 rules**

- 5.3.7 Common Short Course Pylon Racing Rules – (E2k/C32) – Update of rules
- 5.3.8 E2K Electric Pylon Racing – Class specific rules – Update of rules
- 5.3.9 Club 32 Pylon Racing – Class specific rules – Update of rules

## **Fun Fly rules**

- 5.7.3.1 Longest Glide Rules
- 5.7.3.3 Spins & Spot Rules
- 5.7.3.6 Deadstick Aerobatics Rules

end

## **5.0 GENERAL RULES (applicable to all Classes in this rule book)**

### **5.0.1 Regulations for Radio Control Power Models**

The following rules must be read in conjunction with Sections 1 and 2 of the General Regulations and Rules obtainable from BMFA Head Office free of charge.

### **5.0.2 Model Weights**

- (a) Shall be as 1.2.2.1 (b) of the General Regulations noted above. Additional requirements may apply in specific classes where noted.
- (b) Contest organisers may wish to note that a site exemption allowing models which weigh between 7 and 20 kg without fuel to be flown at heights exceeding 400 ft may be granted by the Civil Aviation Authority. For more details contact the BMFA's Leicester office.
- (c) Models that weigh more than 20 kg without fuel with a current Civil Aviation Authority Exemption Certificate in force for the model, may be flown in competition if permitted by the relevant competition rules.

### **5.0.3 Entry**

An entry shall consist of one machine and one reserve machine if desired. Component parts of the two machines may be interchanged, but not with those of other entrants.

### **5.0.4 Transmitters and Receivers**

Rule 2.2.5 of the General Regulations and Rules shall apply.

### **5.0.5 Pilot Competence**

- (a) All entrants in radio control power contests are required to satisfy the CD that they are capable of flying to an adequate safety standard.
- (b) For competitions covered in sections 5.2, 5.3, and 5.4 of this rule book, the BMFA Achievement Scheme 'B' Certificate is mandatory.
- (c) For all other competitions, CDs are strongly recommended to insist that the 'B' Certificate is the required standard of pilot competence.

### **5.0.6 Protests and Appeals**

- (a) It is the right of a competitor to protest against any decision by a Contest Director (CD). Any such protest, however, must be made officially to the CD, and must be made on the day. The protests and appeals procedure to be followed at the contest is also set out in the General Regulations and Rules, Section 2, and in the event of discrepancies they shall take precedence.
- (b) If not satisfied with the CD's decision the competitor must, on the day, hand the CD the protest in writing, together with a fee of double the standard entry fee. The CD will then immediately empanel three appropriate persons to deal with the protest.
- (c) The panel's decision is final, subject to the right of the competitor who submitted the protest to appeal to the BMFA Council.
- (d) Appeals to Council about a decision made at a contest must be made as follows:
  - (i) Notification that an appeal is pending must be sent to the BMFA Competition Secretary to arrive not later than two weeks from the date of the contest.
  - (ii) The appeal itself, together with any supporting evidence, must be sent to the BMFA Competition Secretary to arrive not later than two months from the date of the contest.
- (e) Protests made to Council after the contest may only be made direct to the BMFA Competition Secretary who, after considering the details of the protest, may bring

such protests to the attention of BMFA Technical Council. Notification of an "after the contest" protest must be made to the Competition Secretary within 7 days of the contest and the protest and evidence submitted not later than two months from the date of the contest.

- (f) Protests or appeals arising from a decision made by a Technical Committee on contest related matters may only be made directly to the Competition Secretary and must be accompanied by a £50 fee. The Competition Secretary will then convene a Panel comprising three Technical Committee Chairmen and not including the Chairman of the Technical Committee concerned. This Panel, plus the Competition Secretary, will study the appeal and examine the reasons for the Technical Committee's decision.
- (g) If the protest or appeal is not upheld, then the appellant(s) must be informed of the reasons for the decision. This procedure does not preclude an appellant(s) taking a failed protest or appeal to the BMFA Full Council.
- (h) If the written protest or appeal is upheld, the protest fee will be returned, however if the protest or appeal is unsuccessful the fee will be allocated to the team travel fund of the relevant discipline.

## **5.1 AEROBATICS**

### **5.1.1 GENERAL**

#### **5.1.1.1 Applicability**

All BMFA Fixed Wing RC Aerobatic competitions, except Scale Aerobatics as per Section 5.2, are run on behalf of the BMFA by the Great Britain Radio Control Aerobatic Association (GBRCAA).

#### **5.1.1.2 Types of Competitions**

##### **5.1.1.2.1**

The following competitions are organised each year:

- BMFA Centralised F3A Competitions
- BMFA British National F3A Championships
- BMFA F3A Team Selection Competition(s)
- BMFA F3P Team Selection Competition(s)

##### **5.1.1.2.2**

The GBRCAA also runs National League competitions and the GBRCAA Championships which are run to a similar format as the BMFA Centralised Competitions. Detailed information about these competitions can be obtained from the GBRCAA at [gbrcaa.org](http://gbrcaa.org)

#### **5.1.1.3 Classes and Manoeuvre Schedules**

##### **5.1.1.3.1**

The following Classes are flown at BMFA Competitions:

- Clubman – Schedule C (all F3A competitions except Team Trials)
- Intermediate – Schedule I (all F3A competitions except Team Trials)
- Masters – FAI Schedule A-23 (all F3A competitions except Team Trials)
- FAI Preliminary Schedule – FAI Schedule P-23 (all F3A competitions)
- FAI Preliminary and Finals Schedules – FAI Schedules P-23 and F-23 (BMFA British National Championships only)
- FAI Preliminary, Finals and Unknown Schedules – FAI Schedules P-23, F-23 and approved computer-generated Unknown Schedules (BMFA Team Selection Competition(s) only)
- FAI AP & AF Schedules (F3P Competitions only)

##### **5.1.1.3.2**

Schedules A-23, P-23, F-23, the Unknown Manoeuvre list and AP/AF Schedules can be found in the FAI Sporting Code Section 4 Volume F3 – Radio Control Aerobatics.

#### **5.1.1.4 Pilot Competence**

##### **5.1.1.4.1**

Entrants to BMFA Centralised Competitions, the BMFA National Championships and BMFA Team Selection Competitions shall meet the competency requirements mandated by the BMFA for that competition.

#### 5.1.1.4.2

Entrants to GBRCAA Competitions shall meet the following competency requirements:

- Clubman and Intermediate Class – BMFA A Certificate or SAA Bronze Award
- All other classes – BMFA B Certificate or SAA Silver Award

#### 5.1.1.5 **Disputes**

##### 5.1.1.5.1

Any disputes at BMFA competitions shall be resolved using the guidelines set out in the Protests & Appeals section of the BMFA Contest Rules Section 5 RC Power.

### 5.1.2 **COMPETITION FORMATS**

#### 5.1.2.1 **BMFA Centralised F3A Competitions**

##### 5.1.2.1.1

Under BMFA Specialist Body requirements, the GBRCAA is required to organise a minimum of three Centralised Competitions each year, open to any entrant who meets the BMFA entry requirements. These competitions are advertised on the BMFA web site.

##### 5.1.2.1.2

The format and rounds to count for BMFA Centralised Competitions shall be as follows:

4 Rounds – best 3 from 4

3 Rounds – best 2 from 3

2 Rounds – best 1 from 2

1 Rounds – the 1 round will count

##### 5.1.2.1.3

All round scores will be normalised in accordance with the FAI Sporting Code Section 4 Volume F3 – Radio Control Aerobatics.

#### 5.1.2.2 **BMFA National Championships**

##### 5.1.2.2.1

The competition to decide the National Champion in each class shall use Preliminary and Finals flights. The format and rounds to count shall be as follows:

- 6 Rounds – 4 Preliminary Rounds; 2 Finals Rounds (best 3 from 4 Preliminaries, + best Finals)
- 5 Rounds – 4 Preliminary Rounds; 1 Final Round (best 3 from 4 Preliminaries, + Final)

- 4 Rounds – best 3 from 4
- 3 Rounds – best 2 from 3
- 2 Rounds – best 1 from 2
- 1 Round – the 1 round will count

#### **5.1.2.2.2**

Clubman, Intermediate, Masters and FAI Preliminary Schedules competitors will fly the schedule for their respective classes in all rounds.

#### **5.1.2.2.3**

FAI Preliminary and Finals Schedules competitors will fly Schedule P-23 in the Preliminary rounds and Schedule F-23 in the Finals rounds.

#### **5.1.2.2.4**

All round scores will be normalised in accordance with the FAI Sporting Code Section 4 Volume F3 – Radio Control Aerobatics. Where Finals are flown, the total scores from the Preliminary rounds will be re-normalised to 1000 points, before adding the Finals score to give a total score for the competition result.

### **5.1.2.3 F3A Team Trials**

#### **5.1.2.3.1**

The team for the following year's World or European Championship and the Triple Crown Competition shall be selected based on the results of a single Team Trial Competition in each year.

#### **5.1.2.3.2**

The Team Trial Competition shall be held on two consecutive weekend days between 1<sup>st</sup> September and 30<sup>th</sup> September each year, except any dates within 10 days of a World or European Championship.

#### **5.1.2.3.3**

The Team Trial Competition format will be three rounds on each day – flown in the order, P Schedule, F Schedule, Unknown Schedule. A second, different, Unknown Schedule shall be flown on the second day of the competition.

#### **5.1.2.3.4**

The P and F Schedules shall be the current FAI F3A Preliminary and Finals Schedules in the year of the Team Trial.

#### **5.1.2.3.5**

Flight scores shall be normalised in accordance with the FAI Sporting Code Section 4 Volume F3 – Radio Control Aerobatics.

**5.1.2.3.6**

The final ranking shall be determined in accordance with the following table:

<b>Number of complete rounds</b>	<b>Flights to count</b>
6	Highest 4 scores
5	Highest 3 scores
4	Highest 3 scores
3	Highest 2 scores
2	Highest 1 score

**5.1.2.3.7**

In the event of a tie in scores, the next highest score for the affected competitors will be used to determine the ranking.

**5.1.2.3.8**

If two rounds cannot be completed, a further one day trial will be arranged at the earliest convenient date in order to complete as much of the planned competition format as practicable.

**5.1.2.3.9**

If two complete rounds of the Team Trial (including any rearranged rounds) cannot be completed by 30<sup>th</sup> September in any year, the GBRCAA Committee shall determine the method of selection of team members and their decision (which need only be by majority vote) shall be final and binding. In making any such decision, the GBRCAA Committee shall consider the required period of notice for nomination of team members for ratification by the BMFA Council.

**5.1.2.3.10**

The Contest Director for the Team Trials will be appointed by the Specialist Body.

**5.1.2.3.11**

The F3A & F3P Team Trials will determine the ranking of pilots to represent the United Kingdom at European and World Championships. At the end of their respective qualifying competitions, the top three pilots from the Team Trials will be formally offered a place on the British Team, and if accepted will be recommended to the BMFA as the UK team. If one or more of the top three pilots declines their team place, then the next highest placed pilot in the Team Trial will be offered a place until all places have been filled, or there are no more pilots from the Team Trial willing to be a member of the team. First and second reserve Team Members will also be selected from the next two highest place pilots in the Team Trial that are willing to accept a reserve place in the UK Team.

**5.1.2.3.12**

There may be a fourth team member if that person is a junior according to the FAI rules and meets the BMFA rules for junior qualification below.

Rules for Junior Team member qualification:

- Inclusion as a Junior team member is subject to the BMFA guidelines for 'young and vulnerable persons' and the Junior team member must be accompanied to the event by a parent, guardian or other responsible person
- The Junior pilot must compete in the BMFA Team Selection competition
- To qualify for BMFA Team Selection, a junior must have achieved on average at least 85% of the event winner's score to be eligible for qualification as a Junior Team Member.

#### **5.1.2.4 F3P Competitions and Team Selection Process**

F3P competitions, including National Championships and Team Selection will comprise as many rounds of the AP schedule as time allows. The AF schedule may also be included at the discretion of the Contest Director.

### **5.1.3 MANOEUVRE SCHEDULES**

#### **5.1.3.1 Clubman Schedule**

##### **C-01 Racetrack Take-Off Sequence (K = 1)**

The model is placed on the take-off area, parallel to the flight line and released. The model rolls along the take-off area until flying speed is achieved, then establishes straight climbing flight parallel to the flight line. The model then turns through 180 degrees in a continuous turn and flies back over the manoeuvring area centre line. Take-off is completed once the centre line has been crossed and the model then performs a 180 degree turnaround of the pilot's choice, which is not scored.

Notes: Box limitations do not apply to this manoeuvre. On rough surfaces or when there is a crosswind, it is acceptable for a helper to restrain the model on the ground until take-off power is applied.

Judging notes

- Model does not track straight on take-off: 1-2 points. (Disregard the effect of the take-off surface e.g. ruts and pot holes on grass sites)
- Wings not level after take-off: 1 point per 15 degrees
- Rate of climb too steep: 1-2 points above 30 degrees
- Model goes behind judge's line after take-off: zero points
- Model retouches runway after lift-off: 1 point
- Any part of the aircraft structure becomes detached on take-off: zero points for the whole flight

##### **C-02 Inside Loop (K = 3)**

From upright on the baseline at the centre line, pull through one inside loop to exit upright at baseline height.

Judging notes

- Loop should be of constant radius
- Entry and exit should be same height and start / finish on centre line.

- Loop should be on the centred on centre line

### **C-03 Half Reverse Cuban Eight (K= 2)**

From upright on the baseline fly a horizontal line then pull through 1/8 of an inside loop into a 45° up line, half roll in the centre of this line. Pull through a 5/8 loop to exit upright on the baseline.

Judging notes

- All radii equal
- Entry and exit should be same height
- Half roll should be centred on the 45° down line
- Must remain in the Box to avoid deductions

### **C-04 Slow Roll (K = 3)**

From upright on the baseline perform a slow roll to exit upright on the baseline.

Judging notes

- Constant roll rate
- Roll should take 2 to 3 seconds as a guide
- Model should be inverted on centre line

### **C-05 Half Cuban Eight (K = 2)**

From upright on the baseline fly a horizontal line then pull through 5/8 of an inside loop into a 45° down line, half roll in the centre of this line. Pull through a 1/8 loop to exit upright on the baseline.

Judging notes

- All radii equal
- Entry and exit should be same height
- Half roll should be centred on the 45° down line
- Must remain in the Box to avoid deductions

### **C-06 Immelmann and Split S Combination (K = 3)**

From upright on the baseline pull up into a half inside loop immediately roll to upright, fly past centre on the top line then perform a half roll immediately followed by half an inside loop to exit upright on the baseline.

Judging notes

- Half roll immediately follows the half loop
- Half loop immediately follows half roll
- Constant radius through half loops
- Roll rates constant
- Lines straight, level and wind corrected

### **C-07 Humpty Bump Pull, Pull, Pull with Half Roll Up (K = 2)**

Fly past centre on the baseline, pull up through a  $\frac{1}{4}$  loop into a vertical up line. Half way through this line half roll, At the top of the vertical up line pull through a half inside loop into a vertical down line. At the bottom of the down line, pull through a  $\frac{1}{4}$  loop to exit upright on the baseline

Judging notes.

- Half roll centre of the line
- Constant radius
- Must remain in the Box to avoid deductions

### **C-08 Half Roll, Straight Inverted, Half Roll (K = 2)**

Before centre half roll to inverted, fly through centre, half roll to upright

Judging notes

- Half rolls should be the same distance each side of centre
- Rolls rates consistent

### **C-09 Stall Turn (K= 3)**

From upright on the baseline pull through a  $\frac{1}{4}$  loop into a vertical up line, followed by a stall turn into a vertical down line. Pull through a  $\frac{1}{4}$  loop to exit upright.

Judging notes

- If the stall turn radius is between half and 1 wingspan then downgrade 1 point
- If the stall turn radius is between 1 wingspan and 1.5 wingspans then downgrade 2-3 points
- If the stall turn radius is between 1.5 wingspans and 2 wingspans then downgrade 4-5 points
- If the stall turn radius is greater than 2 wingspans the score shall be zero
- If the aircraft exhibits a pendulum effect after exiting the stall turn then deduct 1 point
- Must remain in the Box to avoid deductions

### **C-10 Half Roll, Outside Loop from Bottom, Half Roll (K = 3)**

From upright on the baseline roll to inverted, on centre push through one outside loop to exit inverted on the baseline, roll to upright.

(Note there should be a pause between the half rolls and the start/ finish of the loop)

Judging notes

- Constant radius
- Entry and exit should be same height
- Loop should be on the centre line
- Rolls rates consistent and line length same before and after

### **C-11 Humpty Bump Pull, Pull, Pull with Half Roll Down (K = 2)**

Pull up through a  $\frac{1}{4}$  loop into a vertical up line. At the top of the vertical up line pull through a half loop into a vertical down line. Half-way through this line perform a half roll. At the bottom of the down line, pull through a  $\frac{1}{4}$  loop to exit upright on the baseline

Judging notes

- Half roll centre of the line
- Constant radius
- Must remain in the Box to avoid deductions

### **C-12 Cuban Eight with Half Rolls (K = 2)**

From upright on the baseline fly past centre and pull through  $\frac{5}{8}$  of an inside loop into a  $45^\circ$  down line. Perform a half roll then pull through  $\frac{3}{4}$  of an inside loop into a  $45^\circ$  down line, perform a half roll then pull through a  $\frac{1}{8}$  loop to exit upright on the baseline.

Judging notes

- All radii equal
- Entry and exit should be same height
- Rolls on  $45$  degrees down lines must be over centre line

### **C-13 Half Square Loop, half roll on upline (K = 2)**

From upright on the baseline pull through a  $\frac{1}{4}$  loop into a vertical up line. Half roll in the centre of the line. Push through a  $\frac{1}{4}$  loop to exit up right on the top line.

Judging notes

- All radii equal
- Roll to be centre of the upline
- Must remain in the Box to avoid deductions

### **C-14 Three Turn Spin (K = 3)**

From upright on the top line, on the centre line of the box perform three consecutive spins followed by a vertical down line. At the bottom of the vertical down line, pull through a  $\frac{1}{4}$  loop followed by a well-defined, straight line to exit upright on the baseline.

Judging notes

- Climbing on entry into spin, downgrade 1 point per 15 degrees
- Yawing before entry into spin, downgrade 1 point per 15 degrees
- Snap-roll entry, zero points

### **C-15 Racetrack Landing Sequence (K = 1)**

On completion of the previous manoeuvre a short straight and level flight should be flown. At reduced power the model turns  $180$  degrees into a level or descending downwind leg and then executes a second  $180$  degree turn upwind for the final descending approach to the runway, touching down inside the landing zone.

Landing is complete after the model has rolled 10 metres or has come to rest inside the landing zone. The landing zone is an area described by a circle of 50 metres radius or lines across a standard runway spaced 100 metres apart where the runway is 10 metres wide.

Judging notes

- Model does not follow landing sequence: zero points.
- Landing gear retracts or wheels come off on landing, zero points
- Model lands outside the zone: zero points
- 90 or 180 degree turns not 90 or 180 degrees 1-2 points
- Wings not level in downwind and upwind legs 1 point per 15 degrees
- Model does not track on runway after touchdown 1-2 points
- Model bounces on touchdown 1-2 points
- Model climbs and dives on downwind leg or final approach to runway 1-2 points
- Model changes heading left or right on approach to runway 1-2 points

The landing will not be downgraded if:

- The pilot elects sideslip to land due to crosswind conditions, in which case the upwind wing will be low
- Wing dips due to cross wind turbulence and is corrected IMMEDIATELY

### 5.1.3.2 Intermediate Schedule

#### I-01 Racetrack Take-off Sequence (K=1)

The model is placed on the take-off area, parallel to the flight line and released. The model rolls along the take-off area until flying speed is achieved, then establishes straight climbing flight parallel to the flight line. The model then turns through 180 degrees in a continuous turn and flies back over the manoeuvring area centre line. Take-off is completed once the centre line has been crossed and the model then performs a 180 degree turnaround of the pilot's choice, which is not scored.

Notes: Box limitations do not apply to this manoeuvre. On rough surfaces or when there is a crosswind, it is acceptable for a helper to restrain the model on the ground until take-off power is applied.

Judging notes

- Model does not track straight on take-off: 1-2 points. (Disregard the effect of the take-off surface e.g. ruts and pot holes on grass sites)
- Wings not level after take-off: 1 point per 15 degrees
- Rate of climb too steep: 1-2 points above 30 degrees
- Model goes behind judge's line after take-off: zero points
- Model retouches runway after lift-off: 1 point
- Any part of the aircraft structure becomes detached on take-off: zero points for the whole flight.

#### I-02 Triangular Loop (Base at the bottom) (K=3)

From upright on the baseline pass centre and pull through a 3/8 loop into a 45° up line. Pull through a 1/4 loop positioned on the centre line into a 45° down line. Pull through a 3/8 loop to exit upright at baseline height.

Judging notes

- All radii equal
- Entry and exit should be same height
- Base of a 45° triangle is longer than other two lines

### **I-03 Stall Turn, Full Roll Up (K=3)**

From upright on the baseline pull through a 1/4 loop into a vertical up line, perform a full roll, followed by a stall turn into a vertical down line. Pull through a 1/4 loop to exit upright.

Judging notes

- Full roll should be centred on vertical up line
- If the stall turn radius is between half and 1 wingspan then downgrade 1 point
- If the stall turn radius is between 1 wingspan and 1.5 wingspans then downgrade 2-3 points
- If the stall turn radius is between 1.5 wingspans and 2 wingspans then downgrade 4-5 points
- If the stall turn radius is greater than 2 wingspans the score shall be zero
- If the aircraft exhibits a pendulum effect after exiting the stall turn then deduct 1 point

### **I-04 Four Point Roll (K=3)**

From upright, perform 4 consecutive 1/4 rolls, exit upright.

Judging notes

- Pauses between rolls should be short and of equal length
- Constant roll rate
- Aircraft is on centre line of box in middle of inverted line

### **I-05 Immelmann Turn with Half Roll (K=2)**

From upright pull into a half loop and immediately perform a half roll to exit upright.

Judging notes

- Constant radius through half loop
- Half roll must immediately follow half loop

### **I-06 Square Loop with 1/2 Rolls in Legs 1 and 3 (K=4)**

From upright on the top line pass centre and push through a 1/4 loop into a vertical down line. Perform a half roll centred on the vertical down line. Pull through a 1/4 loop to upright on the baseline and fly past centre and pull through a 1/4 loop to a vertical up line. Perform a half roll centred on the vertical up line. Push through a 1/4 loop to exit upright on the top line.

Judging notes

- All radii equal
- Manoeuvre performed on centre line
- Half rolls to be in centre of lines

### **I-07 Split S Full Roll, Exit Inverted (K=2)**

From upright on the top line perform a full roll immediately followed by half an outside loop to exit inverted on the baseline.

Judging notes

- Half loop immediately follows full roll
- Constant radius through half loop

### **I-08 Cuban Eight with Half Rolls, Exit Inverted (K=3)**

From inverted on the baseline fly past centre and push through 5/8 of an outside loop into a 45° down line. Perform a half roll in the centre of the 45° down line. Push through 3/4 of an outside loop into a 45° down line. Perform a half roll in the centre of the 45° down line. Push through a 1/8 loop to exit inverted on the baseline.

Judging notes

- Half rolls performed on centre line of box, and in middle of 45° line
- All radii equal

### **I-09 Humpty Bump Push, Pull, Pull (K=2)**

From inverted on the baseline push through a 1/4 loop into a vertical up line. At the top of the vertical up line pull through a half inside loop into a vertical down line. At the bottom of the down line, pull through a 1/4 loop to exit upright on the baseline.

Judging notes

- All radii equal

### **I-10 Figure S (K=4)**

From upright on the baseline on centre pull through half an inside loop and immediately push into half an outside loop to exit upright on the top line.

Judging notes

- All radii equal
- There should be no line between half loops

### **I-11 Figure 6, Half Roll Down (K=3)**

From upright on the top line, push into a vertical down line. Perform a half roll centred on the vertical down line. At the bottom of the down line, push through 3/4 of an outside loop to exit upright at mid height.

Judging notes

- All radii equal
- Roll must be in middle of down line

### **I-12 Knife Edge, Exit Inverted (K=4)**

From upright at mid height before centre perform a 1/4 roll (either direction) into knife edge. Past centre perform a 1/4 roll to exit inverted at mid height.

Judging notes

- Knife edge should be held long enough to demonstrate controlled, sustained knife-edge flight (3 to 5 seconds as a guide).
- Whole manoeuvre should be centred

### **I-13 Half Loop (K=1)**

From inverted at mid height, push through half a loop to exit upright on the top line.

Judging notes

- Radius must be constant

### **I-14 Three Turn Spin (K=4)**

From upright on the top line, on the centre line of the box perform three consecutive spins followed by a vertical down line. At bottom of vertical down line, pull through a 1/4 loop followed by a well-defined, straight line to exit upright on the baseline.

Judging notes

- Climbing on entry into spin, downgrade 1 point per 15 degrees
- Yawing before entry into spin, downgrade 1 point per 15 degrees
- Snap-roll entry, zero points
- Forced entry, severe downgrade
- Spin under or over rotation, downgrade 1 point per 15 degrees

### **I-15 Racetrack Landing Sequence (K=1)**

On completion of the previous manoeuvre a short straight and level flight should be flown. At reduced power the model turns 180 degrees into a level or descending downwind leg and then executes a second 180 degree turn upwind for the final descending approach to the runway, touching down inside the landing zone.

Landing is complete after the model has rolled 10 metres or has come to rest inside the landing zone. The landing zone is an area described by a circle of 50 metres radius or lines across a standard runway spaced 100 metres apart where the runway is 10 metres wide.

Judging notes

- Model does not follow landing sequence: zero points
- Landing gear retracts or wheels come off on landing, zero points
- Model lands outside the zone: zero points
- 90 or 180 degree turns not 90 or 180 degrees 1-2 points
- Wings not level in downwind and upwind legs 1 point per 15 degrees
- Model does not track on runway after touchdown 1-2 points
- Model bounces on touchdown 1-2 points

- Model climbs and dives on downwind leg or final approach to runway 1-2 points
- Model changes heading left or right on approach to runway 1-2 points

The landing will not be downgraded if:

- The pilot elects sideslip to land due to crosswind conditions, in which case the upwind wing will be low
- Wing dips due to cross wind turbulence and is corrected IMMEDIATELY

### 5.1.3.3 FAI Schedules

The manoeuvre schedules for Masters (A-23), FAI P-23, F-23, the Unknown Manoeuvre List and F3P schedules AP and AF can be found in the FAI Sporting Code Section 4 Volume F3 – Radio Control Aerobatics.

## 5.1.4 ADDITIONAL INDOOR AEROBATIC SCHEDULES (with acknowledgements to GBR/CAA)

- 5.1.4.1 (a) The following Indoor Schedules are for the FAI F3P class of models.  
 (b) BMFA and F3P Team Selection Competitions may include any or all of the following schedules: B+, B and C as additional competitions.

### 5.1.4.2 Schedule B+

#### **B+01 Loop with half roll integrated into top 90°, Exit Inverted:**

From upright on the baseline at the centre line pull through a full loop with a half roll integrated into the top quarter. Exit inverted at baseline height.

Judging notes

- All radii equal.
- Entry and exit should be same height.
- Constant roll rate.
- Roll should be integrated with top 90° of loop.

#### **B+02 Half Reverse Cuban Eight, Full Roll up:**

From inverted on the baseline push through a 1/8 loop into a 45 degree up line. Perform a full roll. Pull through a 5/8 loop to exit upright on the baseline.

Judging notes

- All radii equal.
- Up line is not 45 degrees (downgrade 1 point per 15 degrees).
- Heading change (downgrade 1 point per 15 degrees).
- Half roll performed in middle of 45 degree line.

#### **B+03 Reverse Knife Edge:**

From upright on the baseline before centre perform a 1/4 roll (either direction) into knife edge flight. On centre perform a half roll (either direction) into knife edge flight. Perform a 1/4 roll (either direction) to exit upright on the baseline.

Judging notes

- Knife edge should be held long enough to demonstrate controlled, sustained knife-edge flight (2 to 3 seconds as a guide).
- Constant roll rate.
- Manoeuvre centred on centre line.
- Entry and exit should be same height.

#### **B+04 Top Hat, 1/4 Roll Up, 1/4 Roll Down:**

From upright on the baseline pull through a  $\frac{1}{4}$  loop into a vertical up line followed by a  $\frac{1}{4}$  roll (either direction). Pull through a  $\frac{1}{4}$  loop into cross box inverted flight. Pull through a  $\frac{1}{4}$  loop into a vertical down line followed by a  $\frac{1}{4}$  roll (either direction). Pull through a  $\frac{1}{4}$  loop to exit upright on the baseline.

Judging notes

- All radii equal.
- Heading not parallel or perpendicular (downgrade 1 point per 15 degrees).

#### **B+05 2 Roll Rolling Circle:**

From upright on the baseline at the centre line perform a two roll rolling circle to exit upright at baseline height.

Judging notes

- Constant roll rate and radius.
- Manoeuvre centred on centre line.
- Entry and exit should be same height.

#### **B+06 Humpty Bump, Pull, Pull, Push. Half Roll Up and Down. Exit Inverted:**

From upright on the baseline pull through a  $\frac{1}{4}$  loop into a vertical up line. Perform a half roll. At the top of the vertical up line pull through a half inside loop into a vertical down line. Perform a half roll. At the bottom of the down line, push through a  $\frac{1}{4}$  loop to exit inverted on the baseline.

Judging notes

- All radii equal.
- Half rolls to be performed in middle of vertical up line.
- Lines are not vertical (downgrade 1 point per 15 degrees).

#### **B+07 Stall Turn, 1/4 roll up and down. Exit Inverted:**

From inverted on the baseline push through a  $\frac{1}{4}$  loop into a vertical up line on the centre line, perform a  $\frac{1}{4}$  roll, followed by a stall turn into a vertical down line. Perform a  $\frac{1}{4}$  roll. Push through a  $\frac{1}{4}$  loop to exit inverted on the baseline.

Judging notes

- $\frac{1}{4}$  rolls should be centred on the vertical up line.
- If the stall turn is between half and 1 wing span then minus 1 point.
- If the stall turn is between 1 wing span and a 1.5 wing spans then minus 2/3 points.
- If the stall turn is between 1.5 wing spans and a 2 wing spans then minus 4/5 points.
- If the stall turn is greater than 2 wing spans then minus 10 points.
- If the aircraft exhibits a pendulum effect after exiting the stall turn then minus 1 point.

#### **B+08 Half Roll Rolling Half Circle:**

From inverted on the baseline perform a half horizontal circle with an integrated half roll to the outside to exit upright on the baseline.

Judging notes

- Constant roll rate and radius.
- Entry and exit should be same height.

#### **B+09 Cuban Eight with Half Rolls:**

From upright on the baseline fly past centre and pull through  $\frac{5}{8}$  of an inside loop into a  $45^\circ$  down line. Perform a half roll in the centre of the  $45^\circ$  down line. Pull through  $\frac{3}{4}$  of an inside loop into a  $45^\circ$  down line. Perform a half roll in the centre of the  $45^\circ$  down line. Pull through a  $\frac{1}{8}$  loop to exit upright on the baseline.

Judging notes

- Half rolls performed on centre line and in middle of  $45^\circ$  lines.

- All radii equal.

**B+10 Half Knife Edge Circuit, Half Roll, Exit Inverted:**

From upright on the baseline perform a  $\frac{1}{4}$  roll (either direction) to knife edge flight. After a short pause push or pull through a  $\frac{1}{4}$  horizontal circle into cross box knife edge flight. Perform a half roll. Push or pull through a  $\frac{1}{4}$  horizontal circle into a parallel knife edge flight. After a short pause perform a  $\frac{1}{4}$  roll (either direction) to exit inverted on the baseline.

Judging notes

- All radii equal.
- Heading not parallel to hall (downgrade 1 point per 15 degrees).
- Constant knife edge flight (downgrade 1 point per 15 degrees).
- Roll not in centre of cross box flight.
- Constant height.

**B+11 One Torque Roll, Exit Inverted:**

From inverted on the baseline reduce flying speed and pivot the model about the centre of gravity into a vertical hover on the centre line. Pause briefly and then perform one torque roll, pause briefly and then pivot the model about the centre of gravity to exit inverted on the baseline.

Judging notes

- Manoeuvre centred on centre line.
- Height in torque roll to be constant.
- Model does not rotate with torque.

**Maximum score = 370. Promotion = 259 (70%)**

**5.1.4.3**

**Schedule B**

**B-01 Take-off Sequence:**

Take off unassisted and complete no more than  $1\frac{1}{2}$  circuits before entering the first manoeuvre. The climb out should be gradual and 90 degree turns controlled until after  $\frac{1}{2}$ , 1 or  $1\frac{1}{2}$  circuits the model enters the first manoeuvre.

Judging notes.

- Change in height to be smooth and constant.
- Lines parallel to hall.

**B-02 Triangular Loop (Base at the bottom):**

From upright on the baseline pass centre and pull through a  $\frac{3}{8}$  loop into a  $45^\circ$  up line. Pull through a  $\frac{1}{4}$  loop positioned on the centre line into a  $45^\circ$  down line. Pull through a  $\frac{3}{8}$  loop to exit upright at baseline height.

Judging notes.

- All radii equal.
- Entry and exit should be same height.
- The base of a  $45^\circ$  triangle is longer than other two lines.

**B-03 Humpty Bump Pull, Pull, Pull, half roll up:**

From upright on the baseline pull through a  $\frac{1}{4}$  loop into a vertical up line. Perform a half roll. At the top of the vertical up line pull through a half inside loop into a vertical down line. At the bottom of the down line, pull through a  $\frac{1}{4}$  loop to exit upright on the baseline.

Judging notes.

- All radii equal.
- Half roll performed in middle of vertical up line.
- Lines not vertical (downgrade 1 point per 15 degrees).

**B-04 One Roll Rolling Circle:**

From upright on the baseline at the centre line perform a one roll rolling circle to exit upright at baseline height.

Judging notes.

- Constant roll rate and radius.
- Manoeuvre centred on centre line.
- Entry and exit should be same height.

**B-05 Half Knife Edge Square Circuit, exit inverted:**

From upright on the baseline perform a  $\frac{1}{4}$  roll (either direction) to knife edge flight. After a short pause push or pull through a  $\frac{1}{4}$  horizontal circle into cross box knife edge flight. Push or pull through a  $\frac{1}{4}$  horizontal circle into a parallel knife edge flight. After a short pause perform a  $\frac{1}{4}$  roll (either direction) to exit inverted on the baseline.

Judging notes.

- All radii equal.
- Heading not parallel or wings not perpendicular (downgrade 1 point per 15 degrees).
- Constant knife edge flight (downgrade 1 point per 15 degrees).
- Constant height.

**B-06 Square Loop, exit inverted:**

From inverted on the baseline pass centre and push through a  $\frac{1}{4}$  loop into a vertical up line. Push through a  $\frac{1}{4}$  loop into horizontal upright flight. Push through a  $\frac{1}{4}$  loop into a vertical down line. Push through a  $\frac{1}{4}$  loop to exit inverted at baseline height.

Judging notes.

- All radii equal.
- Entry and exit should be same height.
- Lines should be straight (downgrade 1 point per 15 degrees) and of equal length.
- Manoeuvre should be centred on centre line.

**B-07 Half Inverted Circle, half roll on exit:**

From inverted on the baseline perform a half horizontal control line circle immediately followed by a half roll to exit upright on the baseline.

Judging notes.

- All radii equal.
- Consistent radius.
- Entry and exit should be same height.
- Heading change (downgrade 1 point per 15 degrees).
- Half roll should be performed immediately after half horizontal circuit.

**B-08 Stall Turn, Full Roll Up:**

From upright on the baseline pull through a  $\frac{1}{4}$  loop into a vertical up line, perform a full roll, followed by a stall turn into a vertical down line. Pull through a  $\frac{1}{4}$  loop to exit upright.

Judging notes.

- Full roll should be centred on vertical up line.
- If the stall turn is between half and 1 wing span then minus 1 point.
- If the stall turn is between 1 wing span and a 1.5 wing spans then minus  $\frac{2}{3}$  points.
- If the stall turn is between 1.5 wing spans and a 2 wing spans then minus  $\frac{4}{5}$  points.
- If the stall turn is greater than 2 wing spans then minus 10 points.
- If the aircraft exhibits a pendulum effect after exiting the stall turn then minus 1 point.

### **B-09 One Torque Roll:**

From upright on the baseline reduce flying speed and pivot the model about the centre of gravity into a vertical hover on the centre line. Pause briefly and then perform one torque roll, pause briefly and then pivot the model about the centre of gravity to exit upright on the baseline.

Judging notes.

- Manoeuvre centred on centre line.
- Height should be constant through roll.
- Model should rotate with torque.

### **B-10 Landing Sequence:**

Exit the last manoeuvre and complete no more than 1½ circuits before descending to land in front of the pilot. The descent should be gradual and 90 degree turns controlled.

Judging notes.

- Change in height should be smooth and constant.
- Lines should be parallel to hall.

**Maximum score = 370. Promotion = 222 (60%)**

## **5.1.4.4**

### **Schedule C**

#### **C-01 Take-off Sequence:**

Take off unassisted and complete no more than 1½ circuits before entering the first manoeuvre. The climb out should be gradual and 90 degree turns controlled until after ½, 1 or 1½ circuits the model enters the first manoeuvre.

Judging notes.

- Change in height to be smooth and constant.
- Lines parallel to hall.

#### **C-02 Square Loop:**

From upright on the baseline pass centre and pull through a ¼ loop into a vertical up line. Pull through a ¼ loop into horizontal inverted flight. Pull through a ¼ loop into a vertical down line. Pull through a ¼ loop to exit upright at baseline height.

Judging notes.

- All radii equal.
- Entry and exit should be same height.
- Lines are not straight (downgrade 1 point per 15 degrees) and of equal length.
- Manoeuvre centred on centre line.

#### **C-03 Stall Turn:**

From upright on the baseline pull through a ¼ loop into a vertical up line, followed by a stall turn into a vertical down line. Pull through a ¼ loop to exit upright.

Judging notes.

- If the stall turn is between half and 1 wing span then minus 1 point.
- If the stall turn is between 1 wing span and a 1.5 wing spans then minus 2/3 points.
- If the stall turn is between 1.5 wing spans and a 2 wing spans then minus 4/5 points.
- If the stall turn is greater than 2 wing spans then minus 10 points.
- If the aircraft exhibits a pendulum effect after exiting the stall turn then minus 1 point.

#### **C-04 Knife Edge, Exit Inverted:**

From upright on the baseline before centre perform a ¼ roll (either direction) into knife edge. Past centre perform a ¼ roll to exit inverted at baseline height.

Judging notes.

- Knife edge should be held long enough to demonstrate controlled, sustained knife-edge flight (3 to 5 seconds as a guide).
- Manoeuvre centred on centre line.

**C-05 Half Cuban Eight (No Roll):**

From inverted on the baseline push through 5/8 of an outside loop into a 45° down line. Pull through a 1/8 loop to exit upright on the baseline.

Judging notes.

- All radii equal.
- Down line is not 45 degrees (downgrade 1 point per 15 degrees).
- Heading change (downgrade 1 point per 15 degrees).

**C-06 360° Control Line Circuit:**

From upright on the baseline at the centre line perform a 360 degree horizontal control line circle to exit upright on the base line on the centre line.

Judging notes.

- Consistent radius.
- Manoeuvre centred on centre line.
- Entry and exit should be same height.

**C-07 Half Cuban Eight, half roll:**

From upright on the baseline pull through 5/8 of an inside loop into a 45° down line. Perform a half roll in the centre of the 45° down line. Pull through a 1/8 loop to exit upright on the baseline.

Judging notes.

- All radii equal.
- Down line is not 45 degrees (downgrade 1 point per 15 degrees).
- Heading change (downgrade 1 point per 15 degrees).
- Half roll performed in middle of 45 degree line.

**C-08 Prop Hang:**

From upright on the baseline reduce flying speed and pivot the model about the centre of gravity into a vertical hover on the centre line. Hold for 3 to 5 seconds and then pivot the model about the centre of gravity to exit upright on the baseline.

Judging notes.

- Manoeuvre centred on centre line.
- Height of prop hang should be constant.
- Roll rate change during prop hand (downgrade 1 point per 15 degrees).

**C-09 Landing Sequence:**

Exit the last manoeuvre and complete no more than 1½ circuits before descending to land in front of the pilot. The descent should be gradual and 90 degree turns controlled.

Judging notes.

- Change in height to be smooth and constant.
- Lines parallel to hall.

**Maximum score = 230. Promotion = 138 (60%)**

## 5.1.5 VINTAGE AEROBATICS

### 5.1.5.1 Object

To provide an aerobatic competition based on early 1960's practice with specific cut-off dates for model designs and the use of power limiting engine eligibility rules.

### 5.1.5.2 Eligible Models

- (a) Any design which was published, kitted or used in competition prior to 31st December 1964. Proof must be supplied by the competitor if required by any Contest Director.
- (b) A list of eligible models and plan sources has been compiled from information gained from several places. It is available from the BMFA office on request and is offered with no guarantees although every effort has been made to ensure that the information is correct.

### 5.1.5.3 Eligible Engines

- (a) Any two-stroke cross flow engine up to 0.61 in<sup>3</sup> capacity (i.e. no schnuerle ported engines)
- (b) Any four-stroke engine up to 0.80 in<sup>3</sup> capacity.

### 5.1.5.4 Miscellaneous

- (a) Tuned pipes are not allowed.
- (b) Models should keep to the general construction shown on the plan but minor deviations are allowed, e.g. metal engine mount instead of wooden bearers (allows easy change of engine type) and bolts instead rubber bands for securing the wing.
- (c) If the wing is changed from built up balsa construction to foam, this will lead to down-grading in any concours competition unless the plan shows foam construction as an alternative method of construction.
- (d) Similar down-grading will apply to the use of glass fibre fuselages unless they were featured in the original design.
- (e) A fabric/tissue and dope covered model would receive higher marks than a film covered model, assuming the finish was to an identical standard.
- (f) For 0.60 in<sup>3</sup> engines and above, the minimum propeller diameter is to be 12 inches and the minimum pitch is to be 6 inches.

### 5.1.5.5 Scoring

Each manoeuvre flown will be marked out of 10 by each judge. These marks will be multiplied by the appropriate 'K' factor and the total scored for all manoeuvres flown, plus any landing bonuses, will be that judges score for that particular flight.

### 5.1.5.6 Schedule of Manoeuvres (Based on the 1960 FAI schedule)

Manoeuvre	K factor
(1) Take off .....	5
(2) Straight flight into wind (minimum time 5 seconds) .....	5
(3) Procedure turn (left turn 90°, right turn 270°) .....	5
(4) Return straight flight on same flight path as 1 (min. time 5 seconds) .....	5

*cont/...*

(5) Stall turn .....	5
(6) Immelman turn (1/2 loop followed by 1/2 roll) .....	10
(7) Three inside loops (superimposed)	
1st loop.....	4
2nd loop, consecutive, on same axis .....	6
3rd loop, consecutive, on same axis .....	8
(8) Three outside loops (superimposed)	
1st loop.....	6
2nd loop, consecutive, on same axis .....	8
3rd loop, consecutive, on same axis .....	10
(9) Reversal (split S). (1/2 roll followed by 1/2 loop) .....	10
(10) Roll - to be followed immediately by;.....	10
(11) Roll in opposite direction .....	12
(12) Tail slide (model stalls in a vertical attitude, then falls back a minimum of three aircraft lengths, falling forward to recover in normal level flight) .....	15
(13) Horizontal eight .....	12
(14) Cuban Eight .....	12
(15) Vertical eight .....	12
(16) Inverted flight in a straight line (minimum time 5 seconds).....	14
(17) Inverted Horizontal eight, left circle, then right circle (min. diameter of circles 50 m, Max. diameter 100 m).....	24
(18) Vertical upward roll .....	12
(19) Three turn spin (recovery in same direction as entry) .....	12
(20) Approach.....	10
(21) Landing .....	5
Touch down in 20 m circle = 100 points bonus	
Touch down in 50 m circle = 50 points bonus	

## 5.1.6 UKCAA (UK Classic Aerobatic Association) rules

- 5.1.6.1 UKCAA contests are for F3A Aerobatic Aircraft designed and published prior to the 1st of January 1996.
- 5.1.6.2 Refer to [http://www.ukcaa.org.uk/Club/Download/2022/2022\\_UKCAA\\_Rules\\_v2d.pdf](http://www.ukcaa.org.uk/Club/Download/2022/2022_UKCAA_Rules_v2d.pdf) for the latest rules and schedules

## **5.2 IMAC UK SCALE AEROBATICS (with acknowledgements to IMAC UK)**

### **5.2.1 Objective**

Inspired by full-scale aerobatics, the intent is to fly scale aerobatic model aircraft in a competitive and realistic manner that is challenging for the contestants as well as interesting for spectators.

### **5.2.2 General**

- (a) All BMFA regulations and CAA regulations covering the RC flier, aeroplane and equipment, shall be applicable to this competition.
- (b) Consideration of safety for spectators, contest personnel, and other contestants is of the utmost importance in this competition. Any unsportsmanlike conduct or hazardous flying over a controlled spectator area will be cause for immediate disqualification of that flight. Further infractions will result in the removal of that pilot from the contest.

### **5.2.3 Aerobatics Official Scale Flying and Judging Guide.**

#### **5.2.3.1** Details of schedules for all classes and IMAC rules can be downloaded from the IMAC website - <http://imacuk.org>

Note: Unknown schedules are not available until the day of competition. Hard copies only are obtained by the IMAC Competition Secretary for each competition and not distributed until being given to Pilots by the CD at the official pilot briefing.

## **5.3 PYLON RACING**

### **5.3.1 GENERAL**

#### **5.3.1.1 Contest Records**

Within model pylon racing it is possible to exaggerate the true speed of an aircraft by incorrectly positioning the course. For this reason all R/C Power Pylon Racing records submitted must contain a signed statement from the Contest Director to verify that the course was re-measured after the record flight and that all the dimensions are as laid down in the current BMFA or FAI rule books

#### **5.3.1.2 Safety inspection**

(a) All models flown in BMPRA/BMFA competitions, must be safety inspected. The criteria document for the safety check can be found on the BMPRA website, BMFA website (rules section) and the BMPRA Facebook page.

(b) Models that pass will be issued with a safety inspection certificate/sticker. The inspection must be renewed annually or at shorter periods if the model undergoes major modifications or repairs to the areas covered by the inspection. New models must be inspected at the first event that they are entered into.

(c) The CD can request a safety inspection to be carried out on any model, even if it is displaying a current safety scrutineering certificate/sticker.

#### **5.3.1.3 Protective head gear**

(a) Protective head gear must be worn by competitors and race officials when in the racecourse area.

(b) The head gear must offer side impact protection. Conventional construction site head protection will not be allowed, the CD's decision is final.

(c) A motorcycle crash helmet which meets the above coverage requirements is allowed.

#### **5.3.1.4 Pilot certification**

(a) All pilots flying in BMPRA/BMFA pylon race events must hold at least a BMFA Fixed wing 'A' certificate, or under exceptional circumstances such as foreign competitors at the Nationals then the CD may sign off on competency.

#### **5.3.1.5 Race classes**

(a) Only models that are mandated in the current BMFA pylon race rule book are allowed to compete under race conditions. 'Ad hoc' racing with models that do not conform to the rules is not allowed.

### **5.3.2 BMFA Variations F3D, F3E, F3R & F3T Pylon Racing**

(a) None

### 5.3.3 F3D & F3T Leagues Scoring

- (a) The F3D and F3T BMFA Leagues shall employ a scoring system designed to enhance rewards for higher performance (lower race times).
- (b) The overall BMFA League result is achieved using a Weighted Points System applied to the individual League competition results.
- (c) The BMPRA will present a BMPRA League cup to the winners of the F3D and the F3T Leagues at the end of the season.

#### 5.3.3.1 League Scoring System

League points are calculated and awarded for each BMFA F3D and F3T competition held throughout the season with double points awarded for the BMFA Nationals.

##### 5.3.3.1.1 League Scoring Conditions

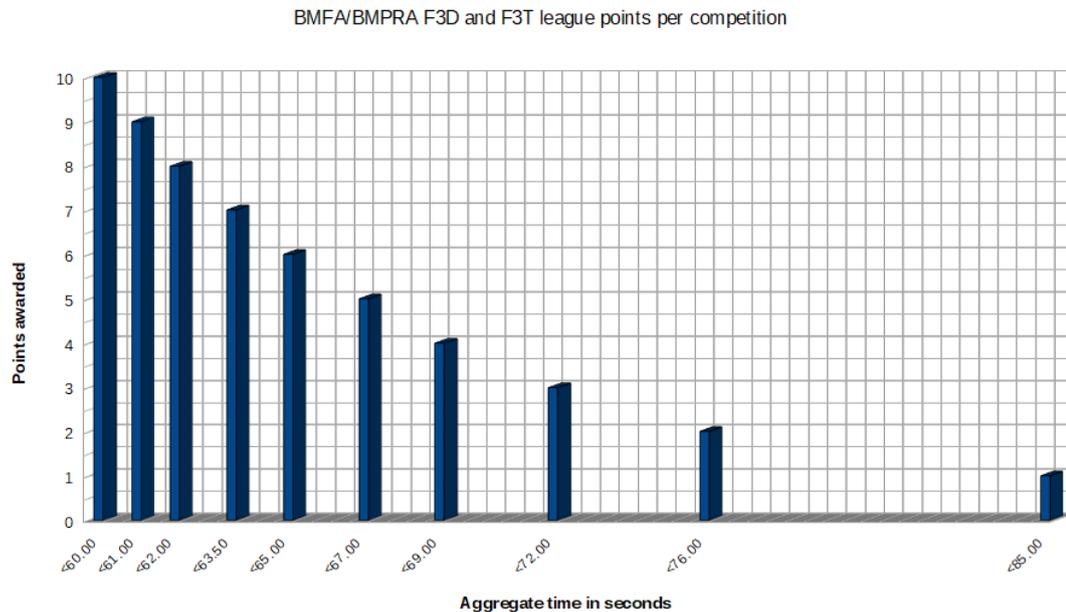
- (a) A valid League racing competition must have a minimum of two pilots achieving a valid aggregate time.
- (b) A valid aggregate time is the average time of at least three valid heats. If there are four heats, then each pilot's worst time is discarded; if there are eight heats a pilot's two worst times are discarded and if there are twelve or more heats a pilot's three worst times are discarded.
- (c) A valid heat time is one which is **not** a 200 which is considered a Penalty time, obtained by having one of the following:
  - ( i) Did Not Start
  - ( ii) Did Not Finish
  - (iii) Disqualification by the Starter or CD
  - (iv) Two cuts.
- (d) The League competition winner is the pilot having the lowest valid aggregate Time. The remaining pilots are ranked in order of increasing times. Pilots who achieve only penalty times during league competitions, are not ranked.
- (e) In the summing of the scores:
  - ( i) at a competition ties shall be broken by a fly-off race if time permits. Otherwise the best single race time shall resolve the tie. If the tie is still not broken then the second best single race time shall be taken and so on until the tie is broken.
  - (ii) of the overall League results the best single race time shall resolve the tie. If the tie is still not broken then the second best single race time shall be taken and so on until the tie is broken.

##### 5.3.3.1.2 Scoring System

- (a) For 2020, the target time is set at 60 seconds and the maximum points available for each League competition winner is 10.
- (b) Only whole points may be awarded. The available whole points from 10 down to 1 are assigned to the following time bands: (See Appendix at 5.3.3.1.3)
- (c) Band 1 is for 60.00 or fewer seconds and = maximum 10 points.
- (d) Band 2 is between 60.01 and 61.00 seconds and = **maximum** 9 points.
- (e) Band 3 is between 61.01 and 62.00 seconds and = **maximum** 8 points.
- (f) Band 4 is for 62.01 to 63.50 seconds and = **maximum** 7 points.
- (g) Subsequent band limits are set at 65, 67, 69, 72, 76 and 85 seconds.
- (h) Band 11 is for 85.01 seconds or greater from which moment no points are awarded.
- (i) The pilot achieving fastest time of the day is awarded one additional point.

### 5.3.3.1.3) Appendix

The maximum points to be awarded (vertical Axis) plotted as a function of the time achieved above the target value of 60 seconds (horizontal axis).



Examples:-

(a) For a race with 5 contestants and:

- The winner gets an average time of 59.4. He is awarded the maximum of 10 points as he is in the top band.
- The 2nd place time is 62.7. He is awarded the max points for that band 7 points.
- The 3<sup>rd</sup> place time is 62.9. He is also in the band which has a max points of 7 awardable and so he is awarded the next available score which is 6 points.
- The 4<sup>th</sup> place gets a time of 64.8 which has a band max of 6, but this has already been awarded, so he gets next available highest score of 5 etc.
- The 5<sup>th</sup> place time is 93.0. He is in the band of Max = 0 so gets zero points.

(b) For a race with 2 pilots :-

- The winner gets a time of 66.1, so gets 5 points.
- The 2nd placed gets time of 72.2, so gets 2 points.

## 5.3.4 Common Short Course Pylon Racing Rules – (E2k/C32)

### 5.3.4.1 Race Course and Procedure

(a) The course size is 40 metres between base pylons and 115.75 metres measured down the course centre line from the base pylons to number 1 pylon. The start line must be 18 metres from the base pylons. Three launching positions must be marked at 4.5 metre intervals along the start line, to the right of the course centre line if possible. When sharing the course with F3 pylon events the start/finish line can be shared at the 30 metre point as per F3 pylon rules.

(b) The pylons should be a minimum of 4.5 metres high, if possible surmounted by a 500 mm x 500 mm (min) square flag. The top of the No. 1 pylon should be above the horizon if possible.

(c) The course layout is an elongated Isosceles triangle and should be set, if possible, with the wind blowing from No. 1 pylon towards the base pylons. The course will be flown in an anti-clockwise direction. It is the responsibility of the Contest Director (CD) to ensure the accurate positioning of the course and pylon marshals. Principally this should be in line with FAI guidelines which can be found at:

#### **5.3.4.2 Pylon Judging**

(a) All competitors are required to fly around each pylon; therefore, pylon judges and flag men are to ensure a complete circuit is made.

(b) A minimum of one pylon judge per pylon will be employed to report any pylon infringements at No.2 and No.3 pylons.

(c) If a model hits any part of a pylon, excluding the flag, then a cut will be awarded, and the race will be stopped for inspection of the model and pylon. The cut will stand for any subsequent re-fly.

(d) No.1 pylon flag men are to ensure that the model has passed the pylon, before dropping their flags or initiating a turn light. Once a No. 1 flag man has dropped his flag, he may not award a cut under any circumstances. The flag should remain aloft at all other times during the race. It is not the responsibility of the No.1 flag men to terminate the race if they count multiple cuts. That information must be relayed to the CD and Starter via radio transmission, but flagging must continue.

(e) A timekeeper equipped with a stopwatch will be allocated to each competitor during the model identification process.

(f) Timekeepers will be aligned with the start finish line, the race time will be taken from the drop of the Starter's flag, until the tenth lap, when the model is in line and passing over the start finish line. A competitor cutting a pylon (flying inside), will have ten percent of the 10 laps time added to his overall time.

(g) The launcher and the model must be behind the start line when the flag drops for the start of the race, otherwise one cut will be awarded against the competitor. If a launcher is judged to have launched the model before the Starter drops the flag, then one cut will be awarded against the competitor. Two cuts in any race, will cause the competitor to be disqualified from that race. No running launches are permitted and the model must primarily be launched by holding the fuselage.

(h) Once a competitor has been awarded two cuts in a race, the competitor must pull out from the course circuit and fly in a manner that does not hinder the other competitors. This action will be indicated by the starter, but in the heat of the moment delays could take place, nevertheless the DQ will still stand.

(i) When an officially acknowledged timing, flagging or other administrative error takes place, only the competitor directly involved will be given a re-fly. Where a dispute exists on lap counting, flagging or timing errors, the Competition Director's decision is final. If the Competition Director is flying in a particular round, he must delegate his responsibilities whilst flying that round.

#### **5.3.4.3 Start Positions and Model identification**

(a) Normally, a competition matrix will ensure that competitors will rotate along the start line positions throughout the competition rounds. The qualifiers in each semi-final or final will choose their own positions on the start line, accordingly to their qualifying times, i.e.: the fastest qualifier has first choice, second qualifier second choice and third qualifier takes the remaining position.

(b) The competitors will identify their models to the pylon judges and timekeepers, switch on their radios and check correct operation of their models when told to do so by the Starter.

#### **5.3.4.4 Starting Procedure and Landing**

(a) The race will consist of a maximum of three competitors flying 10 laps of the course. Models will be hand launched from behind the start line. 30 seconds will be allowed for starting engines in C32 class only.

(b) The models will be launched at one second intervals in all races including finals. Timing will commence upon the drop of the official starters flag regardless of whether the model is launched at that precise moment. Timing ceases at the crossing of the finish line after ten laps are completed.

(c) Competitors and their callers must stand behind the start line at all times until the race is underway but must at all times remain within the boundaries of the course.

(d) Models should land off course and may only be flown between the base pylons into the course on landing by express permission of the Starter.

(e) Competitors may only retrieve their models after the race has finished and all models have landed.

#### **5.3.4.5 Mid-air Collisions**

(a) In the event of a mid-air collision all models in that race must land immediately for inspection. All competitors in that race will have a re-fly which will take place at the end of the round in which the mid-air occurred. Any single cuts awarded prior to the mid-air will stand for the subsequent re-fly. If a pilot has been awarded 2 cuts before the mid-air incident they will not be eligible for a re-fly.

(b) If a competitor suspects a mid-air collision, he should notify the Starter and pull out if instructed to do so. The model will be inspected immediately on landing and if found to be damaged as a result of the mid-air then a re-fly will be awarded.

(c) If the mid-air collision occurs after one competitor has completed 10 laps, then his finishing time/position shall stand. If this situation arises in a semi-final, or final, those competitors involved in the mid-air shall be deemed to have finished behind the one who completed the race and there shall be a "fly off" for the remaining places.

(d) At the CD's discretion, a competitor may be allowed a trimming/check flight to ensure the safe flying characteristics of a model that has been subject to a mid-air. Such check-flying shall not take place until the course has been erected and the CD has granted permission and must not be conducted 'on course' in a simulated race circuit.

#### **5.3.4.6 Dangerous Flying**

Low flying is consistent flying below pylon flag height, which endangers all concerned. The CD may give a competitor a warning for low flying and if the competitor continues to fly low, the CD shall disqualify him from that heat. The initial warning counts for all the following heats, semi-finals and finals. At the CD's discretion, a competitor may be disqualified from the heat or the competition, if it is adjudged that he is flying dangerously.

#### **5.3.4.7 Engine Checking (C32 Only)**

The CD may randomly select (by lottery) one of the semi-finalists who must remove the cylinder head and liner for inspection by two selected examiners. The CD may also request that any engine that has raced on the day, be selected by the examiners for full scrutiny.

#### **5.3.4.8 ESC/Motor Checking (E2K Only)**

The CD may randomly select (by lottery) one of the semi-finalists who must make available his complete model for an RPM check of the installed ESC and Motor Combo. This will be conducted by race officials with a calibrated rev counter and if necessary, an undersized propeller to allow max permitted RPM to be indicated.

#### **5.3.4.9 Model Checking**

(a) The CD may request that any model that is to be flown in the semi-finals and finals, be checked for conformance to the technical regulations prior to those races.

(b) Any model found to be outside the rules will be disqualified. Any competitor who has raced a model that has been subsequently checked and found to be outside the rules will be excluded from that heat.

(c) The offence of exclusion will carry the application of the maximum time penalty. Any heat from which a competitor has been excluded cannot count as a dropped score and will count towards the final score of that competitor.

#### **5.3.4.10 Number of Heats flown**

To account for adverse weather conditions and other possible interruptions to the race day programme, discards are in place. The number of heats that will count towards final scores from the number of heats flown will be as follows;

<b>Heats Flown</b>	<b>Heats Counting</b>
3	3
4	3
5	3
6	4
7	5
8	6
9	7
10	8

#### **5.3.4.11 Scoring**

(a) In the event that only the heats are flown, the Pilot with the lowest total times from the number of valid heats counted will be deemed to be the winner of the event. Ordinarily, if entry numbers and time permits, two semi-finals and a final will be flown, to determine the top six positions in the results of the competition. Competitors for the semi-finals will be the top six fastest competitors from the accumulated valid heat times. Competitors for the final will be the three fastest pilots from the semi-finals. In the event of six semi finalists the two races will be pilot 1 vs 3 vs 5 and pilot 2 vs 4 vs 6.

(b) Any 'No-times' (NT), 'Did Not Start' (DNS) 'Did Not Finish' (DNF) 'Double Cut' (DC) or Disqualified (DQ) cases recorded will be awarded a time of 200 seconds.

(c) Ties in finals will be decided by taking the better semi-final time. If a tie still exists, then the fastest single heat time will determine the winner.

(d) League points will be awarded in descending order from ten down to one for the top ten competitors in each event. Positions one to six will be determined by times completed in the semi-finals and finals if they are flown. Positions seven to ten will be determined from times accumulated in the heats only. Pilots finishing tenth and below will score one league point each. The pilot with the fastest time of the day will also earn one extra league point. At the conclusion of the League each pilot may drop their one lowest scoring round only. All other scores count to the final placings in the League.

(e) A valid League racing competition must have a minimum of two pilots achieving a valid heat time in at least 3 rounds.

(f) A valid heat time for league scoring is one which is not a 200 (which is considered a Penalty time)

(g) Ties in the league will be broken by taking the fastest time of the league. If the tie still exists, then the second fastest time will be taken and so on until the tie is broken.

(h) At the end of the racing season and the expiration of the scheduled league calendar, the pilot accumulating the highest number of league points will be determined to be the BMFA/BMPRA E2k or C32 Pylon League Champion.

(i) In the event that the competition is the British National Championships, the overall winner of the event and the BMFA Short Course Pylon Racing British Nationals Champion, will be either the pilot with the lowest total times from the number of valid heats counted or, if Semi Finals and Finals are flown, the fastest pilot in the final of the event.

#### **5.3.4.11 Miscellaneous**

(a) Protective headgear must be worn at all times by all personnel in the flying area as described in the General Rules at 5.3.1.3

(b) Only three models are allowed per competitor at each event and no competitor may fly any model that has previously been flown by another competitor at the same competition.

(c) No model can be shared between pilots in a competition after it has been flown in that competition by one pilot.

#### **5.3.4.12 Interpretation of the rules**

In the event of protests around the interpretation or application of these rules on a competition day, the final decision will be at the discretion of the uninvolved BMPRA Committee members present (Jury) and their decision will be final, notwithstanding a competitor's right to protest or appeal using formal procedures after the event.

## **5.3.5 E2K Electric Pylon Racing – Class specific rules**

### **5.3.5.1 Intention**

(a) The Electric Club 2000 (E2K) class of Pylon Racing is intended as a sport class of entry level electric powered Pylon Racing for both beginner and expert competitor alike at club level.

(b) These rules define a Pylon Racing model comprising parts readily available from the UK modelling trade with no need for competitors to manufacture component items and which may be flown at most flying sites within the UK

(c) The following rules apply to the model specification, engines and functionality of the aircraft suitable for the E2K class.

### **5.3.5.2 Definition of Radio Control Pylon Racing Model Aircraft (E2K Type)**

(a) Model aircraft in which the propulsion energy is provided by an electric motor and in which the lift is obtained by aerodynamic forces acting on the supporting surfaces, which, except for the control areas, must remain fixed in flight.

(b) No delta, oblique, variable geometry, variable section or flying wing type aircraft are permitted.

### **5.3.5.3 Technical Specifications of E2K Pylon Racing Model Aircraft.**

(a) The model aircraft must be of conventional design with forward wing and an aft tailplane. The motor may be mounted in either tractor or pusher configuration on the fuselage of the airframe.

(b) Each competitor may process and use a maximum of three models during a competition.

(c) Wings may be vacuum bagged over foam or glass clothed under Mylar films for a smooth surface finish but must not be manufactured using hollow moulding techniques or pre-formed wing skins brought together over a spar to form a lifting wing section. Built up wings are permitted.

(d) With the exception of the elevator pushrod, the use of carbon fibre is not allowed anywhere within the model.

### **5.3.5.4 Weight**

The minimum weight of the model shall be no less than 2.25lbs (1022 g) and a maximum weight of not more than 3.75lbs (1705 g) ready to fly. If ballast is used it must be permanently and safely affixed to the model.

### **5.3.5.5 Fuselage**

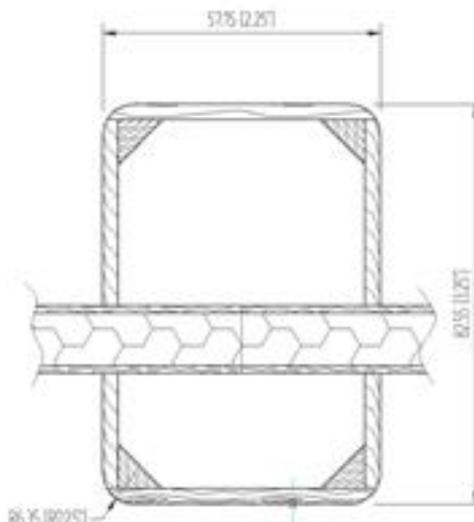
(a) The motor bulkhead shall be a minimum of 2 1/4" X 2 1/4" (57.15mm x 57.15mm) The motor can be mounted directly on to the bulkhead or onto the bulkhead via 4 parallel stand off pillars to assist with achieving the correct C of G. These pillars can be up to a maximum of 80mm long and 15mm diameter.

(b) Cross section measured at the wing trailing edge shall be a minimum of 2 1/4" X 2 1/4" (57.15mm x 57.15mm).

Typical E2K fuselage cross section

Notes

- 1) The fuselage sides will remain straight/flat between the corner radius's.
- 2) There will be no ducts or channels to circumvent the cross sectional area which will be a minimum of 7.258 Sq" (46.83 sq Cm)
- 3) In cases where the fuselage is arranged to mimic a diamond/sawtooth then the dimensions will still be taken in the vertical and horizontal planes and in all cases the cross sectional area is the over riding factor.



(c) The fuselage at the deepest point shall measure a minimum of 2 1/4" wide X 3 1/4" (57.15mm x 82.55mm) deep, including the wing section and shall occur somewhere between the wing leading and trailing edges. This measurement will be taken in a plane that is vertical (perpendicular) to the wings zero incidence line. The sides of the fuselage between the fillets must be made up of straight lines

The cross section must represent an area of a minimum of 7.258 Sq" (46.83 sq Cm).

(d) Wing fairings, fillets or motor cowling's are not allowed.

(e) Maximum radius of the fuselage corners will be 1/4" (6.35mm).

### 5.3.5.6 Wing

(a) The wing shall have a minimum span of 35" (889mm) and shall be a constant chord in this span.

(b) The minimum wing thickness shall be 7/8" (22.22mm) for the 35" (889mm) span.

(c) The minimum wing area shall be 300 sq. inches (19.36dm<sup>2</sup>).

### 5.3.5.7 Functionality

(a) The model must be controlled by the competitor using radio control to operate conventional ailerons, elevator and rudder only or any combination thereof in addition to a motor speed control.

(b) Coupling of control surfaces or electronic mixing is prohibited other than to drive dual ailerons (operating only as ailerons) from the same transmitter stick. Flaps or Flapperons of any kind are prohibited as is coupling of control surfaces on the wing to the elevator function (e.g. SnapFlap) of the model or any variable mixing governed by the speed of the model in flight (e.g. GPS monitoring).

(c) Additionally: The use of radio receivers and servos of types with integrated gyro stabilisation capability is prohibited.

(d) The following are permitted:

- (i) Control rate and exponential devices that are manually switched by the competitor.
  - (ii) Any type of button or lever, switch, or dial control that is initiated or activated and terminated by the competitor.
- (e) The following are prohibited:
- (i) Any system that can move the control surfaces without direct competitor input in response to other inputs.
  - (ii) Pre-programmed devices capable of automatically performing a series of commands.
  - (iii) Auto-pilots or gyros for automatic stabilisation of the model aircraft.
  - (iv) Automatic flight path guidance.
  - (v) Any type of learning function involving manoeuvre to manoeuvre or flight to flight analysis.

#### **5.3.5.8 Powertrain**

- (a) Batteries – Any Lithium Polymer battery may be used with a maximum of 4 cells.
- (b) The only motors permitted will be:-
  - Turnigy SK3-3536-1400kV
  - Aerodrive XP Outrunner,
  - Overlander Thumper 3536/05 all versions,
  - NTM Prop drive series 35-36A 1400kV.
- (c) Motors may not be tuned or modified and can only be repaired using standard replacement parts except as stated at paragraphs (f) and (g).
- (d) The motor must be capable of being throttled on demand.
- (e) The only permitted electronic speed controllers (ESC) are those that have been officially flashed to limit the free running rpm to no more than 15,232 rpm. Flashed speed controllers are currently available via the British Miniature Pylon Racing Association (BMPRA).
- (f) In the interests of safety any excess on the length of the motor shaft to the rear of the motor can be removed.
- (g) The motors prop driver casting can be secured to the magnet housing by the use of a maximum of four small bolts if it is not the type to clamp onto the motor shaft via compression collet.

#### **5.3.5.9 Propellers and Spinners**

- (a) The only permitted propeller is the APC 8"x8" (Product Code: LP08080) injection moulded 'Sport' range, two bladed propeller designed for use on internal combustion engines. Fitted propellers must maintain the diameter, pitch, blade width, and blade aerofoil of the approved part at every measurable station.
- (b) The following modifications may be made without penalty:
  - (i) One blade may be sanded on the top (front) side only for balancing.

(ii) Edges and tips may be sanded, but only as much as necessary to remove sharp moulding flash.

(iii) The propeller hub hole may be slightly reamed to allow a good fit on the motors drive shaft.

(c) The motor must be fitted with a rounded spinner nut or a 1 1/2" (38.1mm) minimum diameter plastic spinner unless in pusher configuration in which case the foremost part of the model fuselage should be suitable rounded (i.e. no Needle noses).

## **5.3.6 Club 32 Pylon Racing – Class specific rules**

### **5.3.6.1 Intention**

(a) The Club 32 class (C32) of Pylon Racing is intended as a sport class of entry level internal combustion powered Pylon Racing for both beginner and expert competitor alike at club level

(b) These rules define a Pylon Racing model comprising parts readily available from the UK modelling trade with no need for competitors to manufacture component items and which may be flown at most flying sites within the UK

(c) The following rules apply to the model specification, engines and functionality of the aircraft suitable for the C32 class.

### **5.3.6.2 Definition of Radio Control Pylon Racing Model Aircraft (Club 32 Type)**

(a) Model aircraft in which the propulsion energy is provided by a piston type engine and in which the lift is obtained by aerodynamic forces acting on the supporting surfaces, which, except for the control areas, must remain fixed in flight.

(b) No delta, oblique, variable geometry, variable section or flying wing type aircraft are permitted.

### **5.3.6.3 Technical Specifications of C32 Pylon Racing Model Aircraft.**

(a) The model aircraft must be of conventional design with forward wing and an aft tailplane with the engine mounted in tractor configuration in the nose of the airframe.

(b) Each competitor may process and use a maximum of three models during a competition.

(c) The use of composite materials such as fibre glass and epoxy for wing skinning or aramid cloth and epoxy for fuselage reinforcement and hinging is permitted in the construction of the models.

(d) The use of carbon fibre cloth, tow or other products made from it, is prohibited except for the formation of pushrods, moveable surface control horns or wing hold-down dowels.

(e) Wings may be vacuum bagged over foam or glass clothed under Mylar films for a smooth surface finish but must not be manufactured using hollow moulding techniques or pre-formed wing skins brought together over a spar to form a lifting wing section. Built up wings are permitted. (See also 5.8.3.2 (b))

### **5.3.6.4 Weight**

Weight, less fuel but including all equipment necessary for flight, shall be at least 1160 g (2 pounds 9 ounces). If ballast is used it must be permanently and safely affixed to the model.

### **5.3.6.5 Fuselage**

The fuselage shall have a minimum height of 127 mm [5 inches] and a minimum width of 69.85 mm [2.75 inches]. The measurements to be of the fuselage body and are to exclude any fins, attachments or spacers. Both minimum dimensions must occur at some point within the wing chord. Fillets are not considered part of the fuselage or lifting surfaces. The fuselage will have a closed area at the above measuring points of a minimum of 60 sq Cm, the CD may ask for proof templates and suitable supporting documentation to verify this cross sectional area.

#### 5.3.6.6 Engine Cowls

Cowling of the engine or silencer is prohibited. A natural fair line of the fuselage around the lower part of the crankcase and a ring around the prop driver behind the spinner, is permitted.

#### 5.3.6.7 Wing / Lifting Surfaces

(a) The total projected area of the wing lifting surface shall be a minimum of 19.35 dm<sup>2</sup> [300 sq. inches]. The tailplane is not included in the wing lifting surface calculation.

(b) Minimum wing span shall be 890 mm [35 inches]. Maximum wing span shall be 1000 mm. [39.4 inches].

(c) Wing thickness shall be at least 22.23 mm [7/8 inch] at the wing root and 15.88 mm [5/8 inch] at the wing tip which is measured at a maximum of 50.8 mm [2 inches] in from the wing tip outermost point. Wing thickness may only decrease in a straight line taper from root to tip as viewed from the leading or trailing edge.

**Note:** Root shall be defined as the innermost wing section, not counting fillets that may be measured without removing the wing from the fuselage.

#### 5.3.6.8 Functionality

(a) The model must be controlled by the competitor using radio control to operate conventional ailerons, elevator, rudder and throttle controls only or any combination thereof.

(b) Coupling of control surfaces or electronic mixing is prohibited other than to drive dual ailerons (operating only as ailerons) from the same transmitter stick. Flaps or flapperons of any kind are prohibited as is coupling of control surfaces on the wing to the elevator function (e.g. SnapFlap) of the model or any variable mixing governed by the speed of the model in flight (e.g. GPS monitoring).

(c) Additionally: The use of radio receivers and servos of types with integrated gyro stabilisation capability is prohibited.

(d) The following are permitted:

(i) Control rate and exponential devices that are manually switched by the competitor.

(ii) Any type of button or lever, switch, or dial control that is initiated or activated and terminated by the competitor.

(e) The following are prohibited:

(i) Any system that can move the control surfaces without direct competitor input in response to other inputs.

(ii) Pre-programmed devices capable of automatically performing a series of commands.

(iii) Auto-pilots or gyros for automatic stabilisation of the model aircraft.

(iv) Automatic flight path guidance.

(v) Any type of learning function involving manoeuvre to manoeuvre or flight to flight analysis.

### **5.3.6.9 Engine(s)**

(a) The only permitted engines are:

- West 32 Pylon special
- ASP 32
- Super Custom (SC) 32

(b) Engine modifications of any type whatsoever are prohibited. The engine must be fitted with the head shim if supplied by the manufacturer and any replacement parts must be those supplied directly or indirectly by the manufacturers or UK agents (Just Engines for ASP and J Perkins for SC 32 & Weston UK).

(c) In the case of the ASP and SC 32, the needle valve may be positioned on either the carburettor or at the rear mounted position utilising the brackets provided for this by the manufacturer. The engine must be used with the silencer provided by the manufacturer/distributor. Swapping of silencers between the ASP/SC brands and the Weston are prohibited.

(d) The engine must be capable of being throttled on demand.

(e) The BMPRA under restricted commercial supply circumstances, may authorise additional engines to be approved for the C32 class.

### **5.3.6.10 Exhaust**

The exhaust outlet must be of a round form (tolerance 0.1mm ovality) and must have an outlet diameter no greater than 7.1 mm.

### **5.3.6.11 Propellers and spinners**

(a) The only permitted propeller is the APC 8"x8" (Product Code: LP08080 ) injection moulded 'Sport' range, two bladed propeller designed for use on internal combustion engines. Fitted propellers must maintain the diameter, pitch, blade width, and blade aerofoil of the approved part at every measurable station.

(b) The following modifications may be made without penalty:

- (i) One blade may be sanded on the top (front) side only for balancing.
- (ii) Edges and tips may be sanded, but only as much as necessary to remove sharp moulding flash.
- (iii) The propeller hub hole may be slightly reamed to allow a good fit on the engines drive shaft.

(c) The model shall be fitted with a rounded nose spinner at the front of the engine with a diameter of at least 38 mm [1.5 inches]. There is no restriction on the material or dynamic balancing of the spinner, but domed propeller retaining nuts are prohibited unless they meet the minimum spinner diameter requirement.

(d) Counter-balanced spinner back-plates are prohibited.

### **5.3.6.12 Fuel System**

(a) The fuel system may only be pressurised from the engine's exhaust system. Other pumping of the fuel from tank to engine is prohibited. A fixed or weighted pick up is permitted. Any type of bladder, sack, pacifier or bag to contain the fuel within the tank is prohibited.

(b) In-flight adjustment of the fuel/air mix to the engine carburettor is prohibited.

### **5.3.6.13 Fuel**

The official race fuel is West Systems ProSynth 2000 with 10% nitro as produced by Weston UK and must be used as supplied by the manufacturer with no without additives. Fuel will be provided for official BMFA competitions.

## **5.4 HELICOPTERS**

### **5.4.1 GENERAL**

#### **5.4.1.1 Model Weight**

The maximum weight of radio controlled helicopters shall not exceed 6.5 kg with fuel

### **5.4.2 BMFA VARIATIONS ON F3C HELICOPTER**

**Note:** The FAI Sporting Code for the F3C class rules can be downloaded at [www.fai.org/ciam-documents](http://www.fai.org/ciam-documents) or obtained direct from BMFA Head Office.

#### **5.4.2.1 Scrutineering and Noise testing**

At UK domestic competitions, scrutineering and noise testing will be done as the CD decides and will normally only be done if concern is expressed about any particular model or where local rules apply.

#### **5.4.2.2 Local Rules**

Local rules may apply to any UK contest and will be notified to the competitors by the CD prior to the start of the contest.

#### **5.4.2.3 One Day Contests**

The normal programme will consist of four rounds of the 'P' schedule with the best three rounds scoring.

At the CD's discretion, and after discussion with the pilots prior to the start of the contest, one of the rounds may be replaced by a 'F' schedule.

#### **5.4.2.4 Multi Day Contests**

A full schedule of four 'P' rounds and three 'F' rounds will be flown if possible.

#### **5.4.2.5 Judges**

The normal complement of judges for a UK domestic competition will be three but this may be altered at the CD's discretion.

#### **5.4.2.6 Contest Director**

The Contest Director for each competition will be appointed by the Specialist Body.

Any queries or protests concerning the contest must be taken up only with the CD.

If a protest is not settled to the protester's satisfaction by the CD then the BMFA General Rule 2.3.9 shall apply.

#### **5.4.2.7 Team Trials**

Details and dates for the F3C Team Selection competition(s) run by the AHA will be published on the BMFA and AHA websites. Team selection competitions shall not be arranged (or re-arranged) to clash with any other competitions, either at home or abroad, at which team members would normally take part.

The F3C Team Selection competitions will use the current FAI 'P' schedule only. The AHA will aim to organise two BMFA Team Selection competitions per year depending on the availability of dates and / or venues but a minimum of one competition will always be run. If two competitions are run, then the lowest normalised score for each pilot from the two competitions will be dropped to give a final (highest) normalised score for each pilot from both competitions. In the event of a draw, then the pilot with the highest dropped score will finish above the other.

The F3C team selection competitions will determine the British Team to represent the UK (GBR) at the European and World FAI Championships. The top 3 scoring pilots will be formally offered a place on the British Team and if accepted will be recommended to the BMFA as the GBR Team. If one or more of the top 3 pilots decline their team place or are unavailable for the dates of the Championships then the next highest placed pilot will be offered a place until all places are filled or there are no more pilots from the team selection competitions. A reserve team member will be selected from the next highest placed pilot in the team selections competitions who is willing to accept a reserve place in the GBR team.

There may be a fourth team member as long as he or she is a junior according to the FAI Rules and can only be accepted if he or she is accompanied to the Championship by a parent or guardian.

### **5.4.3 BMFA VARIATIONS ON F3N HELICOPTER**

BMFA variations are the same as F3C with the following exceptions:

#### **5.4.3.1 One Day Contest**

The normal programme will consist of four rounds (Sets, Freestyle, Sets, Music Freestyle) with the best three rounds scoring. Any pilot scoring less than 65% of the top pilot's score will be deemed as being in the F3N Sport Class.

#### **5.4.3.2 Multi-Day Contests**

A full schedule of four Preliminary Rounds (Sets, Freestyle, Sets, Music Freestyle) and three Final rounds (Sets, Freestyle, Music Freestyle) will be flown if possible.

#### **5.4.3.3 Judges**

The normal complement of judges for a UK domestic competition will be five but this may be altered at the CD's discretion.

#### **5.4.3.4 Team Trials**

F3N team trials will comprise of three separate competitions consisting of two one-day competitions, the dates of which will be announced at the beginning of the year, and the BMFA Nationals. For each pilot, the highest results of two of the three competitions will be added together to give the final result ie each pilot's lowest competition result of the three competitions will be dropped.

### **5.4.4 European Sportsmans Helicopter**

#### **5.4.4.1 Object**

To provide a competition class that will encourage pilots with a range of abilities to compete on an equal standing

#### **5.4.4.2 General Rules**

**5.4.4.2.1** The general rules of the competition shall be as for F3C FAI Helicopter with the following alterations. Where confusion exists, these alterations shall take precedence.

**5.4.4.2.2** The decisions of the specific competition Contest Director (CD) are final.

**5.4.4.2.3** The competition is open to all pilots and types of model helicopter / engine combinations and to all pilots, excepting those pilots who have flown in any BMFA or international F3C competition in the previous 24 months from the date of the Power Nationals.

**5.4.3.2.4** Interchange of judges during a competition is only permitted between round so as to maintain consistency of scoring.

**5.4.4.2.5** During the flying the judges are out of bounds to all except the CD, the score sheet collector and the caller of the next pilot.

**5.4.4.2.6** Judges should know the score requirements as defined in the latest issue of the European Sportsmans schedule.

**5.4.4.2.7** All manoeuvres are marked out of 10 points. Points are lost as decided by the individual judge in accordance with the current rules.

**5.4.4.2.8 Dangerous Flying**

Any flying that is deemed to be dangerous will result in the round score being zero. This must be enforced to ensure that all pilots choose their schedules with care and fly them safely. Dangerous manoeuvres should be determined as:

- (a) Flying behind the judge line at any time.
- (b) Overflying the pits area or any other area designated as a no-fly zone.
- (c) Any manoeuvre where the pilot is obviously flying to the limits of his ability and is not in full control of his model.
- (d) A crash shall not be deemed to be the result of dangerous flying unless (c) above is applicable. A genuine accident or mechanical failure should not be punished.

**5.4.4.2.9 Calling Manoeuvres**

Each pilot should have a caller who should be well practised. The manoeuvre names should be called in the correct sequence, each followed by a call of 'now' when the manoeuvre is commenced and 'complete' when the manoeuvre is finished.

Manoeuvres only be marked by the judges between the calls of 'now' and 'complete'. If the manoeuvre is not called, is called early, is called late or is called out of sequence then it should be penalised.

**5.4.4.2.10 Pilot Position**

All flying must be away from the judge line and the model must not be flown between the pilot and the judges. The CD may, however, allow this in very exceptional circumstances.

**5.4.4.3 Flight Programme**

The manoeuvre schedules are listed in section 5.4.4.4 below with the starting and ending direction (UU = Upwind - Upwind; DD = Downwind - Downwind; DU = Downwind - Upwind; UD = Upwind - Downwind) for each manoeuvre, relative to the wind, as indicated.

All hovering manoeuvres should be flown upwind (UU). When selecting aerobatic manoeuvres, the starting and ending direction should be considered so that the schedule flows. For example, an upwind manoeuvre would be followed by a downwind manoeuvre.

The competitor has 9 minutes to complete one of the two schedules "A "or "B ". For the two schedules, the pilot must choose 8 manoeuvres consisting of: -

2 hover figures + 5 aerobatic figures and landing.

Or - 3 hover figures + 4 aerobatic figures and landing.

Or - 4 hover figures + 3 aerobatic figures and landing.

All manoeuvres for Schedule A have a K factor of 1.0 and for Schedule B a K factor of 1.3 to recognise the increased difficulty.

All other rules are in accordance with the latest FAI sporting code for Radio Controlled Model Helicopters.

#### 5.4.4.4

### Schedule of Manoeuvres

#### SCHEDULE A

##### A1: TRIANGLE POINT DOWN (UU) K=1.0

MA takes off vertically from the helipad and ascends to 2m, stops and hovers for at least 2 seconds. Ascends 5m backwards in a straight line to 7m over flag 1(2), stops and hovers for at least 2 seconds. Perform a straight horizontal line forward, stops over flag 2 (1) and hovers for at least 2 seconds. Descends 5m backwards in a straight line to 2m above the helipad, stops and hovers for at least 2 seconds. Descends and lands onto the helipad.

##### A2: DIAMOND (UU) K=1.0

MA takes off vertically from the helipad and ascends to 2m, stops and hovers for at least 2 seconds. Ascends 2.5m backwards in a straight line, stops over flag 1(2) and hovers for at least 2 seconds. Ascends 2.5m forwards in a straight line to 7m above the helipad, stops and hovers for at least 2 seconds. Descend 2.5m forwards in a straight line, stops over flag 2(1) and hovers for at least 2 seconds. Descend 2.5m backwards in a straight line to 2m above the helipad, stops and hovers for at least 2 seconds. Descends and lands onto the helipad.

##### A3: M (UU) K=1.0

MA takes off vertically from the helipad and ascends to 2m, stops and hovers for at least 2 seconds. Flies backwards; stops over flag 1(2) and hovers for at least 2 seconds. Ascends 5m vertically, stops and hovers for at least 2 seconds. Descends 5m forwards in a straight line at 45° to 2m above the helipad, stops and hovers for at least 2 seconds. Ascends 5m forwards in a straight line at 45°, stops over flag 2 (1) and hovers for at least 2 seconds. Descends vertically 5m, stops and hovers for at least 2 seconds. Flies backwards; stops over 2m above the helipad and hovers for at least 2 seconds. Descends and lands onto the helipad.

##### A4: HOURGLASS (UU) K-1.0

MA takes off vertically from the helipad and ascends to 2 m, stops and hovers for at least 2 seconds. Flies backwards; stops over flag 1(2) and hovers for at least 2 seconds. Ascends 5m forward in a straight line, stops 7m over flag 2(1) and hovers for at least 2 seconds. Flies backwards; stops over flag 1(2) and hovers for at least 2 seconds. Descends 5m forward in a straight line, stops 2m over flag 2(1) and hovers for at least 2 seconds. Flies backwards; stops 2m over the helipad and hovers for at least 2 seconds. Descends and lands onto the helipad.

##### A5: DOUBLE STALL-TURNS (DD) K=1.3

Before the centre line, MA flies horizontally in a straight line for a minimum of 10m, as soon as the centre line is crossed, it performs a pulled quarter loop followed by a vertical ascent. At the top of the ascent, MA performs a 180° stall-turn in any direction followed by a vertical descent, then a pulled and centered half loop followed by a vertical ascent. At the top of the ascent, MA performs a 180° stall-turn in any direction followed by a vertical descent then a pulled quarter loop which must end on the centre line. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

##### A6: OVAL WITH TWO HALF ROLLS (UU) K=1.0

Before the centre line, MA flies horizontally in a straight line for a minimum of 10m, after crossing the centreline, MA continues the same trajectory for a minimum of 30m. Performs a pulled half loop, followed by a half roll (any direction), followed by a centered horizontal straight line. MA performs a half roll (in any direction) followed by a pulled half loop, followed by a straight line at the same altitude as when entering the figure up to the centreline. After crossing the centreline, MA performs a straight horizontal line for a minimum of 10m.

#### A7: COBRA WITH 90° LOOP (DD) K=1.0

MA flies horizontally in a straight line for a minimum of 10m, performs 1/8 of a pulled loop and ascends in a straight line at 45°. Before the top, MA performs a pushed and centered 90° quarter loop. Descends in a straight line at 45°, then performs 1/8 of a pulled loop. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

#### A8: LOOP (UU) K=1.0

Before the centre line, the MA flies horizontally in a straight line for a minimum of 10m, as soon as the centreline is crossed, it performs a full centred loop. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

#### A9: Full roll (DD) K=1.0

MA flies horizontally in a straight line for a minimum of 10m, then performs a full centered roll. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

#### A10: 180° STALL-TURN (UD) K=1.0

Before the centre line, the MA flies horizontally in a straight line for a minimum of 10m, as soon as the centreline is crossed, it performs a pulled quarter loop followed by a vertical ascent. At the end of the ascent the MA performs a stall turn followed by a vertical descent. Performs a pulled quarter loop which must end on the centreline. MA performs straight horizontal line for a minimum of 10 m at the same altitude as when entering the figure.

#### A11: LANDING WITH 180° TURN (DU) K=1.0

The manoeuvre begins at least 10m before the centre line at a minimum altitude of 20m. On passing the centreline the MA should begin the 180° turn downhill, the rate of turn and airspeed should be constant from that point to a point just before touchdown at the helipad. The flight path of the MA should appear as a semicircle when viewed from above, starting in the vertical plane and ending in the centre of the helipad's centre circle. The MA's flight path must never be parallel to the ground or judge's line.

### SCHEDULE B

#### B1: TRIANGLE POINT DOWN WITH 180° PIROUETTES (UU) K=1.3

MA takes off vertically from the helipad and ascends to 2m, stops and hovers for at least 2 seconds. Ascends 5m backwards in a straight line while simultaneously performing a 180° pirouette to 7m over flag 1(2), stops and hovers for at least 2 seconds. Performs straight horizontal line backwards while simultaneously performing two 180° pirouettes, stops over flag 2(1) and hovers for at least 2 seconds. Descends 5m forwards in a straight line while simultaneously performing a 180° pirouette, stops at 2m over the helipad and hovers for at least 2 seconds. Descends and lands onto the helipad.

Note: The direction of the pirouettes is not imposed.

#### B2: DIAMOND WITH PIROUETTES 360° (UU) K=1.3

MA takes off vertically from the helipad and ascends to 2m, stops and hovers for at least 2 seconds. Ascends 2.5m backwards in a straight line, stops over flag 1(2) and hovers for at least 2 seconds. Performs a 360° pirouette (any direction), stops and hovers for at least 2 seconds. Ascends 2.5m forwards in a straight line to 7m above the helipad, stops and hovers for at least 2 seconds. Descends 2.5m forwards in a straight line, stops over flag 2(1) and hovers for at least 2 seconds. Performs a 360° pirouette (any direction), stops and hovers for at least 2 seconds. Descend 2.5m backwards in a straight line,

stops over 2m over the helipad and hovers for at least 2 seconds. Descends and lands onto the helipad.

**B3: FLOWER (UU) K=1.3**

MA takes off vertically from the helipad and ascends to 2m, stops and hovers for at least 2 seconds. Ascends backwards describing the upper left (right) quarter of a circle with a radius of 5m, stops over flag 1(2) and hovers for at least 2 seconds. Descends forwards by describing a semicircle with a radius of 5m while performing simultaneously a 360° pirouette in any direction, stops over flag 2 (1) and hovers for at least 2 seconds. Descends backwards describing the upper right (left) quarter of a circle with a radius of 5m, stops 2m over the helipad and hovers for at least 2 seconds. Descends and lands onto the helipad.

**B4: VERTICAL CIRCLE (UU) K=1.3**

MA takes off vertically from the helipad and ascends to 2 m, stops and hovers for at least 2 seconds. Go forward to make a vertical circle with a radius of 5m, stops 2m over the helipad and hovers for at least 2 seconds. Descends and lands onto the helipad.

**B5: COBRA WITH PULLED FLIP (DD) K=1.3**

MA flies horizontally in a straight line for a minimum of 10m, performs 1/8 of a pulled loop and ascends in a straight line at 45°. At the top, the MA performs a centered pulled 270° flip. Descends in a straight line at 45°, then performs 1/8 of a pulled loop. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

**B6: LOOP WITH TWO STALL TURNS (UU) K=1.3**

Before the centreline, the MA flies horizontally in a straight line for a minimum of 10m, as soon the centreline is crossed, it performs a pulled 1 ¼ loop. When reaching half of the height of the former loop the MA performs a vertical ascent. At the end of the ascent the MA performs a 180° stall turn in any direction followed by a vertical descent. By reaching half the height of the old loop again the MA performs a pulled half loop in opposite direction. When reaching half of the height of the first loop the MA performs a second vertical ascent. At the end of the ascent the MA performs a 180° stall turn in any direction followed by a vertical descent. When reaching half of the height of the first loop the MA performs a pulled quarter loop which must end on the centreline. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

Note 1: Vertical ascents must be started at half the height of the loop with the MA being vertical. Note2: The stall turns must be executed at the height.

**B7: TWO OPPOSITE ROLLS (DD) K=1.3**

MA flies horizontally in a straight line for a minimum of 10m, then performs a roll in any direction followed by a recognizable centered straight line and then a second roll in the opposite direction to the first. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

**B8: PULLBACK WITH HALF LOOP (UU) K=1.3**

Before the centreline, the MA flies horizontally in a straight line for a minimum of 10m, as soon as the centreline is crossed, the MA performs 1/4 of a pulled loop followed by a vertical ascent. At the top of the ascent, vertical tail down, the MA performs a centered backwards half loop. At the end of the half loop, vertical nose down, the MA performs a vertical descent. MA performs a quarter pulled loop which must end on the centre line. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

**B9: CUBAN EIGHT (DD) K=1.3**

Before the centreline, the MA flies horizontally in a straight line for a minimum of 10m, crosses the centreline and continues the same trajectory. MA performs 3/4 of a pulled loop, descends at 45° while performing a centered half roll (any direction), performs 3/4 of pulled loop, descends at 45° while performing a centered half roll (any direction), performs 1/8 of a pulled loop. MA performs a straight horizontal line for a minimum of 10m at the same altitude as when entering the figure.

Note 1: Before and after the roll the MA may fly a straight line. All straight lines must have equal length.

#### B10: OVAL WITH FLIP (UU) K=1.3

Before the centreline, the MA flies horizontally in a straight line for a minimum of 10m, crosses the centreline and continues the same trajectory. Performs a pulled half loop followed by a traveling centered pushed 360° flip in horizontal flight. Performs a pulled half loop that ends at same height as when entering the figure. Performs a straight horizontal line to the centreline, continues the same trajectory for at least 10m.

Note 1: Before and after the flip the MA may fly a straight line on its back, both lines must equal length.

Note 2: The MA should be flat on the centre line.

#### B11: LANDING WITH TWO 90° TURNS (DU) K=1.3

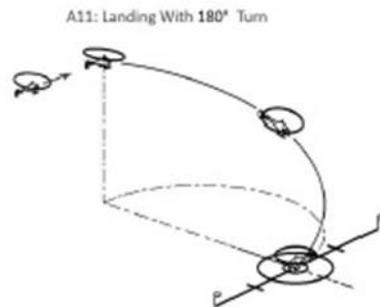
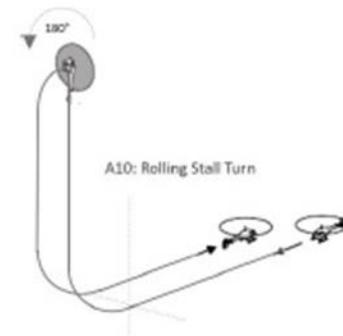
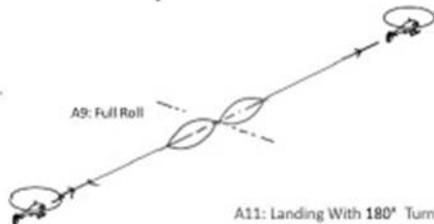
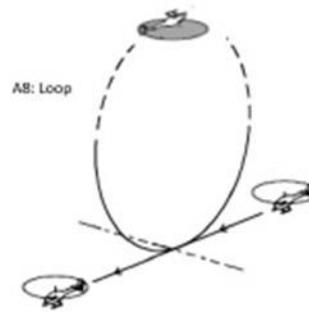
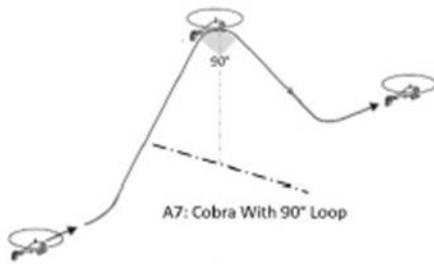
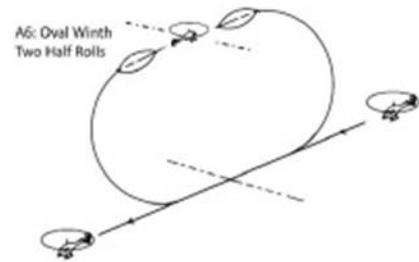
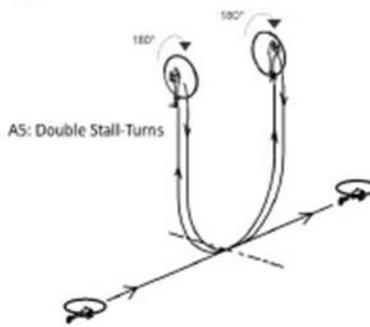
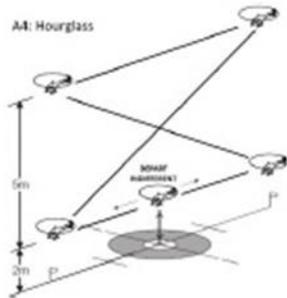
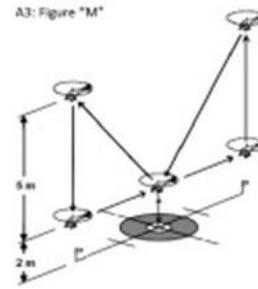
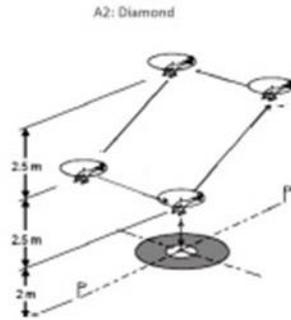
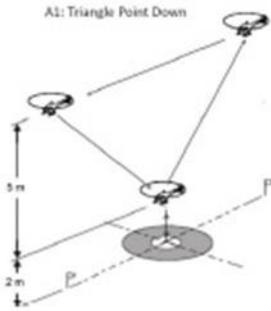
The manoeuvre begins at least 10m before the centreline at a minimum altitude of 20m. On passing the centreline the MA executes 3 constantly descending sides with two 90° turns in the direction of the central circle and lands against the wind into the helipad.

Note 1: The descent rate must be constant to a point just before touchdown on the helipad.

Note 2: Parts of the second side, the second 90° turn and the beginning of the third side may be flown out of the 60° flight window.

*Manoeuvre Diagrams appear overleaf.*

# MANOEUVRE SCHEDULE "A"





## 5.5 WATERPLANES

### 5.5.1 GENERAL

- (a) In the case of scale or Schneider competitions, a tie will be decided on the static judging results.
- (b) In non-scale competitions, a tie may be decided by static judging marks and/or marks for waterborne operation.
- (c) All competition classes are open to powered, fixed wing models only.
- (d) Schneider competitions are open to scale models of any aircraft which were built and prepared for any of the Schneider Trophy races, held between the years 1913 to 1931, even though they may not have flown in the actual contests.

### 5.5.2 NON-SCALE MODELS

#### 5.5.2.1 Static Marks

- (1.1) Workmanship ..... 10 marks
- (1.2) Finish..... 10 marks

#### 5.5.2.2 Static Flotation Test (2 minutes duration)

- (2.1) Model attitude on water ..... 5 marks  
Waterline on float not excessively low at bow or stern.

#### 5.5.2.3 Waterborne Operation

- (3.1) Navigability..... 8 marks  
Model taxied into wind, followed by turns of 90 degrees left and right of wind direction. The angle of turn may be reduced by the judges to take account of wind strength.
- (3.2) Take-off..... 12 marks  
Controlled acceleration as model rises on to 'step', planes and lifts off smoothly with a steady climb-out.
- (3.3) Alighting ..... 10 marks  
Good approach with clean touch-down and minimum bounce.

#### 5.5.2.4 Flight Test

- (4.1) Smooth manoeuvring and control response ..... 8 marks
- (4.2) Flight performance to display capabilities of the design ..... 12 marks

#### 5.5.2.5 Competition Regulations

- (a) Engines must be started within 5 minutes and model become airborne within 10 minutes of the pilot being called for his competition flight. Should the engine fail to start within the initial 5 minutes, one further start is permitted, provided 10 minutes time to airborne is still achieved. Failure to start, or exceed the 10 minute limit, counts as one attempt. One further attempt is permitted after all other competitors have completed their flight or first attempt.
- (b) All pilots must announce their take-off after completing the navigability test. Non-announcement will result in the loss of the take-off marks.
- (c) Failure to complete the flight will count as one abort. One further flight is permitted after all other competitors have completed their flights or second attempts.

- (d) There will be only one caution for infringement of safety rules. A subsequent infringement on the same flight cancels all points scored for the flight section in that round.
- (e) Two rounds will be flown but where two rounds cannot be flown (except where failures are as under (a) and/or (c) above) then first round results apply.
- (f) Only models which are pre-entered will be allowed in the competition. No substitutions.

### 5.5.3 SCALE MODELS

#### 5.5.3.1 Static

- (a) Documentation

The following documentation will be required:

- (i) A three-view drawing of the aircraft reproduced from books or magazines, minimum 100 mm wingspan.
- (ii) Three photographs of the aircraft, one to be of the actual aircraft being modelled, and proof of colour scheme.

- (b) Judging

All items are to be judged from a distance of 3 metres.

- (1.1) Accuracy of outline ..... 10 marks
- (1.2) Craftsmanship..... 10 marks
- (1.3) Finish (colour and markings) ..... 10 marks
- (1.4) Realism ..... 10 marks

#### 5.5.3.2 Static Flotation Test (2 minutes duration)

- (2.1) Correct attitude on the water .....5 marks  
As defined either by authentic photographs or drawings.

#### 5.5.3.3 Waterborne Operations

- (3.1) Navigability.....8 marks  
Model taxied into wind, followed by turns of 90o left and right of wind direction. The angle of turn may be reduced by the judges to take account of wind strength.
- (3.2) Take-off..... 12 marks  
Controlled acceleration as model rises on to 'step', planes and lifts off smoothly with a steady climb-out.
- (3.3) Alighting ..... 10 marks  
Good approach with clean touch-down and minimum bounce.

#### 5.5.3.4 Flight Test

- (4.1) Free style flight pattern, applicable to full size ..... 15 marks

#### 5.5.3.5 Competition Regulations

All competition regulations are as section 5.5.2.5, Competition Regulations for Non-Scale Models.

#### 5.5.4 Schneider Models.

Open to scale models of any aircraft which were built and prepared for any of the

Schneider Trophy races, held between the years 1913 to 1931, even though they may not have flown in the actual contests.

**5.5.4.1 Static**

All static rules and marks are as section 5.5.3.1.

**5.5.4.2 Static Floatation Test (2 minutes Duration)**

Test and marks as section 5.5.3.2.

**5.5.4.3 Waterborne Operation**

All waterborne operations and marks as section 5.5.3.3.

**5.5.4.4 Flight Test**

- (4.1) Flight realism..... 12 marks
- (4.2) Pylon turn.....8 marks

**5.5.4.5 Competition Regulations**

Competition regulations will be as section 5.5.2.5 with the addition of the following:

- (a) Models are required to fly 5 continuous laps around the three legs of a 750 metre course. Each turning point will be flagged and if the model turns inside any pylon, a 'cut' will be called and that lap not counted. Two 'cuts' are allowed, with the flight not to exceed 7 laps.

**For more details of the British Waterplane Association, a contact address is available from the BMFA's Leicester office.**

## **5.6 SAM 35 VINTAGE R/C POWER COMPETITION CLASSES**

### **Guidelines**

#### **5.6.1 Objective**

All flyers should bear in mind that we are here to perpetuate the models and the flying of yesteryear. The objective of these new classes and rules is to revive the use of radio guidance; to enable gentle competition without the need to exceed flying field limitations; and to do so in a spirit of comradeship as most of our compatriots in the Free Flight and Control Line sectors do.

With variations in engine run times for differing categories of model it is hoped to encourage models with modest performance to compete on level terms with out-and-out duration types.

#### **5.6.2 Responsibility.**

The Contest Director (CD) is responsible for the smooth running of competitions. Any queries should be directed to him or her directly.

#### **5.6.3 Eligible Models**

(1) Date.

The cut-off date for Flying Fives and Handicap Duration is 1st January 1960, i.e. original models must have been built and flown prior to this date. Designs published after this date but which were built and flown prior to the cut-off date are eligible. Onus of proof of this rests with the competitor. Therefore it is essential to have the appropriate documentation, e.g. a plan, magazine article, original dated photograph, all with dimensions, etc., with you.

(2) Types.

Models include Power, and, Electric and Glider in Handicap Duration, Power, up to 3.5cc in Flying Five.

(3) Prohibited accessories.

Any aids to performance such as flaps, airbrakes, DTs, turbulators, (interior or exterior), unless original.

(4) Scaling.

Models may be scaled up or down but must conform to the original outline, aerofoils, number of ribs, dihedral.

(5) Structural integrity

This shall be a high priority. Therefore, internal bracing, e.g., extra fuselage spacers/dihedral braces, unobtrusive sheeting, increases in spar sections or replacing balsa with stronger woods or ply, shear webbing, anti-warp bracing of any part, may be used. Externally, the use of plastic-coated steel trace as a 'flying' or 'landing' wire is to be encouraged, as are struts if necessary.

(6) Covering.

Materials should be of a texture corresponding to that of the original.

#### **5.6.4 Builder of the Model Rule**

In normal circumstances, the model shall have been built by the flyer, Exceptions to this are:

- (1) The builder is incapacitated or no longer alive.
- (2) Restored original models.

- (3) A Proxy may fly models from abroad or from the U.K.
- (4) Models may be loaned to overseas visitors.
- (5) If a model has been built as a joint effort between two or more flyers, they may each fly it in the same competition but they only qualify for one prize.

### **5.6.5 Engines**

#### **(1) Handicap Duration**

Engines are limited in capacity to that used originally and may be diesel, glow, or spark. For models scaled up or down from the original, engine capacity shall be pro rata e.g. a Junior 60 may have a 3.5cc diesel, 6cc spark or, .26cu.in. 4-stroke, for instance. For a Majestic Major (a Junior 60 scaled up approx. 1.5 times) a 10cc diesel or glow or, a 15cc spark engine would be appropriate, etc,

#### **(2) Flying Fives**

Engines are limited to a maximum of 3.5cc and may be diesel, glow, or spark.

#### **(3) Silencing**

For both classes, mufflers or silencers shall not be removed from any engine but may be modified for extra quietness. This includes most of the Cox range. Spark ignition engines should be silenced. Long 'quiet' silencers are permitted. Tuned pipes are not. All engines should comply with the DoE/BMFA noise emission requirements.

#### **(4) Electric Motors and Batteries**

Unlimited. It is felt at this time to be unnecessary, due to the weights involved, to impose any limits.

### **5.6.6 Attempts**

One aborted flight per round is allowed. The second attempt will be scored. A flight can be aborted at any time during the motor run, but not after it has cut. For gliders, an attempt must be declared within 30 seconds of release from the towline.

### **5.6.7 Reserve Models.**

Not allowed.

Note. The objective is to keep these competitions to the 'Spirit of SAM' and to be FUN to take part in; to allow anyone with any model a fair chance.

### **5.6.8 Crew.**

All Classes: One helper/launcher required (for safety). May also be the timekeeper.

### **5.6.9 Height Limitations and Other Variables.**

CDs shall ensure that flyers are made aware of any height limitations and ensure they are complied with. If necessary, the Contest Director may change any rule on the day, at his discretion and usually dependent on field and/or weather restrictions but, only to the benefit of all flyers and to this end. For example:

- (1) Change engine run times.
- (2) Use a 'rolling' maximum e.g., to increase the max time by one or two minutes per round. A seven-minute max would require the model to be down in nine.
- (3) Adjust glider towline/bungee lengths.

### **5.6.10 Insurance and Certification.**

Proof of insurance and, your BMFA 'A' certificate will be required at most competitions.

Check with the organisers before travelling. Please note that although it is the recognised route, you do not have to be a BMFA member to obtain a certificate. Host clubs must ensure that all flyers are made aware of club rules and field disciplines.

Any behaviour disregarding such rules or, any unsafe flying shall be discussed jointly by the club representative and the CD. The offender shall be warned to comply and may be requested to leave.

## **CLASSES OF COMPETITION**

### **5.6.11 Flying Fives.**

- (1) 2 channels, rudder/elevator only. A third channel can be used for an engine cut-off if desired.
- (2) 5cc of fuel only.  
Note: Use of the cylindrical, coloured top, 5cc tank is an advantage. However, CDs shall be prepared and have a 5cc syringe available.
- (3) Tanks shall not be topped up after a motor has been started, except for a fly-off when models may be launched simultaneously.
- (4) 3 flights (rounds) x 5-minute maxes and an unlimited fly-off if needed.
- (5) The model must land within a CD designated area within 7 minutes. Failure to do so will void the flight.

### **5.6.12 Handicap Duration.**

- (1) 3 channels, rudder, elevator, engine/electric motor or rudder/elevator only for gliders.
- (2) Pylon and high performance types - 20 secs motor run.  
'Sport' types - 75 secs motor run  
Gliders - 100 metre (328ft) maximum line or, bungee with a maximum of 33% elastic element.
- (3) 3 x 5 min. maxes and fly-off as Flying Five above.
- (4) The Model must land within designated area within 7 minutes. Failure to do so will void the flight.

### **5.6.13 Spot Landing Guidelines**

This competition often tempts those who would not normally dream of competing. Models, apart from gliders, must RoG. Flight limited to five minutes. Or, if the model (apart from gliders) is suitable, i.e., has a proper undercarriage and has RoG capability, an attempt at the spot/line may be made at the end of Flying Five or Duration flight. Distance from spot (or line, a piece of high visibility tape secured to the ground crosswind) measured by the CD from the nearest front wheel or towhook. 'Taxiing' is NOT allowed. Models must not be 'dived' on to the spot! Other than this it is up to the CD to explain the task. These guidelines give successful formats:

- (1) Take-off or tow-up. Perform one horizontal eight. Cut (power models) engine. Land, stopping as close to spot/line as possible.
- (2) Take-off or tow-up. Fly out of circuit. Enter into a rectangular circuit on the up-wind leg. Cut engine (power models) on the down-wind leg. Glide base leg and land.

## **5.6.14 SAM 35 Vintage/Nostalgia Power Duration**

### **5.6.14.1 Object :**

To encourage the flying of nostalgic F/F power duration type models, flown with R/C assist which should only act as basic guidance and to facilitate landing within approximately 50 metres of the take off point. The competition is for limited power run models flown to a maximum time and will consist of three classes.

### **5.6.14.2 Classes**

Class 1 1 cc Max, For instance, Cox 049 / 051 , MPJET, ED Bee etc  
Class 2 3.5 cc Max For instance, PAW 19, Torpedo 19, OS 19, AM 35 etc  
Class 3 Open

### **5.6.14.3 Models**

- (1) Models to have been designed & or published by the 1st Jan1961.
- (2) Designs may be scaled up or down, with appropriate changes to material sizes. Rib spacing may be changed, but aerofoil section to remain as the original.
- (3) Covering material. Solartex, Litespan, Airspan or any tissue type film is acceptable along with tissue, silk, nylon and any of the above over mylar. The use of modern self adhesive or other film type materials is discouraged and such models may only be flown at the discretion of the CD.
- (4) Motor size according to class. Only plain bearing crankshafts. No Schnuerle ported motors allowed.
- (5) Motor run:

Class 1	30 secs.
Class 2	20 secs.
Class 3	15 secs.

The CD is authorised to make alternative decisions on the motor run allowed on the day, considering prevailing weather conditions.

The motor run may be controlled either by radio or a clockwork timer,

### **5.6.14.4 Radio**

ONLY 2.4 GHz is allowed. 27MHz or 35MHz is NOT allowed

### **5.6.14.5 Flights**

- (a) One 'no flight' will be allowed per round, either as a result of an over-run, or a flight less than 30 sec.
- (b) Competitors are allowed 3 flights, each with a maximum depending on conditions. The maximum is to be set by the CD at the start of the competition with the aim to have it set at around 4 or 5 minutes but the time decided upon will be to suit the prevailing weather conditions.
- (c) Aggregate score to count. If necessary a final fly-off round will be held.
- (d) A helper is allowed for starting and launching.

Note: Suitable designs:

Class 1	Slicker Mite, Junior Mallard, Ramrod, Spacer, Starduster, etc.
Class 2	Slicker, Mallard, Zoot Suit, Creep, Dixielander, Y-Bar, Swiss Miss, Dreamweaver, Heatwave, Tototl, Ramrod 600 / 800, Spacer 600 / 800, Satellite 550 / 650, Starduster 600, etc.
Class 3	Super Slicker, Ramrod 1000, Starduster 900, Satellite 788GLH, Satellite 1000 / 1300 etc.

## 5.6.15 SAM 35 Sport Nostalgia Power Duration

All rules of Vintage/ Nostalgia Power Duration will apply except:  
Class 3 Open will allow standard ball raced four-stroke engines.

The motor run times will be:

- Class 1 45 secs.
- Class 2 30 secs.
- Class 3 22.5 secs.

With the usual proviso that these may be altered on the day by the CD depending on the prevailing weather.

The models allowed must be genuine 'sport' type models and not the duration designs allowed for in Vintage/ Nostalgia Power Duration. The CD's decision on this matter will be final.

Note: Suitable designs:

Tomboy, Hepcat, Matador, Outlaw, Ethereal Lady, Simplex, Black Magic, Southerner, Trenton Terror, Quaker Flash, Miss America, etc.

However, any model that is essentially a duration model with a cabin (e.g. many American PAA loaders) will be categorised as a high performance model and NOT a sport model."

All enquiries to BILL LONGLEY on 01258 488833, or at [tasuma@btconnect.com](mailto:tasuma@btconnect.com)

## 5.7 FUN FLY COMPETITION with acknowledgements to the British Fun Fly Association (funfly.bmfa.org)

### 5.7.1 CLASS 1

#### 5.7.1.1 Eligibility

- (a) Fun Fly Class 1 competitions are open to all.
- (b) Fun Fly Class 1 at the Power National Championships is open to all but competitors must hold the BMFA Achievement Scheme Power Fixed Wing B Certificate.

#### 5.7.1.2 Model Configuration

Any fixed wing model weighing not less than 2 lbs up to a maximum of 11 lbs may be used. It must be capable of taking off, landing and standing unassisted on its own fixed undercarriage of at least one main wheel.

Models must not be changed in configuration during the competition. There will be:

- (a) No substituting of wings or any other flying surfaces.
- (b) No changes in control surface area.
- (c) If a model is 'written off' during the competition, any substitute model must be of fundamentally the same configuration. The substitute model will only be allowed to be used at the CD's discretion.
- (d) All IC engines should be fitted with an effective silencer. Tuned exhaust systems are permitted.
- (e) Stability systems (gyros) are prohibited.

#### 5.7.1.3 Motive Power Limitations

IC Engine: Two Stroke: .....Up to a maximum of 0.61 cu ins  
Four Stroke: .....Up to a maximum of 0.70 cu ins  
Electric Motor: ..... Unrestricted

IC engines will be inspected at the CD's discretion.

#### 5.7.1.4 Competition Details

- (a) A competition may involve any of the following tasks:

Longest Glide, Triple Thrash, Limbo, Touch & Go, Deadstick Aerobatics, Touch & Go Pylon Race, Touch & Go Bang, Roop, Spins & Spot, Water Carrying and Doughnut Drop

- (b) Power National Championships

The competition will involve five tasks, as detailed below:

- 1 Longest Glide
- 2 Triple Thrash
- 3 Limbo
- 4 Touch & Go's
- 5 Mystery Round (Task randomly selected from the following: Deadstick Aerobatics, Touch & Go Pylon Race, Touch & Go Bang and Roop). The mystery task will be decided by a random draw on day one of the competition. The Task drawn will be omitted from the draw the following year.

## **5.7.2 CLASS 2**

### **5.7.2.1 Eligibility**

- (a) The competition is open to all.
- (b) However, competitors who in the previous year placed in the first three places overall in any official BMFA/BFFA class 1 competition will be excluded from entry into Class 2 competitions for the following year.
- (c) Any of the previous year's Class 2 entrants are eligible to enter the following year apart from the overall Class 2 winner in any official BMFA/BFFA competition, who shall be excluded from entry into Class 2 for a period of a further two years. For example, the winner of Class 2 in 2020 may not enter Class 2 again until 2023.
- (d) For the Power National Championships, paragraphs (a)–(c) apply but additionally competitors must hold the BMFA Achievement Scheme Power Fixed Wing B Certificate.

### **5.7.2.2 Model Configuration**

Any fixed wing model weighing not less than 2 lbs up to a maximum of 11 lbs may be used. It must be capable of taking off, landing and standing unassisted on its own fixed undercarriage of at least one main wheel.

Models must not be changed in configuration during the competition. There will be:

- (a) A maximum of four flight controls – Ailerons, Elevator, Rudder and Throttle
- (b) No coupling or mixing of the flight controls. Using the transmitter to replicate a mechanical mix (i.e. shortening the clevis on a control arm to droop the ailerons) is permitted. The CD will have the final decision on whether the mix would be achievable through a mechanical means and is within the spirit of Class 2. If a mechanical mix is used it may not be switched in or out during the flight, must remain in operation from take-off to landing and may not be altered (increased or decreased) in any way.
- (c) No substituting of wings or any other flying surfaces.
- (d) No changes in control surface area.
- (e) If a model is 'written off' during the competition, any substitute model must be fundamentally the same configuration. The substitute model will only be allowed to be used at the CD's discretion.
- (f) All IC engines should be fitted with an effective silencer.
- (g) Stability systems (gyros) are prohibited.

### **5.7.2.3 Motive Power Limitations**

IC Engine: Two Stroke: .....Up to a maximum of 0.42 cu ins

Four Stroke: .....Up to a maximum of 0.52 cu ins

Electric Power: ..... Up to a maximum of 3 cell Li-Po batteries

Standard silencers only may be used, i.e. no tuned pipes. IC engines will be inspected and battery packs inspected at the CD's discretion. Fuel feed is to be by suction or exhaust pressure only.

*cont/...*

#### 5.7.2.4 Competition Details

- (a) For competition details see 5.7.1.4 (a).
- (b) However, the Power National Championships will involve five tasks, as detailed below:
  - 1 Longest Glide
  - 2 Spins & Spot
  - 3 Limbo
  - 4 Touch & Go's
  - 5 Mystery Round (a task randomly selected from the following: Deadstick Aerobatics, Water Carrying, Touch & Go Bang and Doughnut Drop). The mystery task will be decided on day 1 of the competition by a random draw, but if either Deadstick Aerobatics or Touch and Go Bang are selected by class 1, then that selected task will be withdrawn from class 2's selection. The task drawn will be omitted from the draw the following year.

#### 5.7.3 Individual Task Rules

##### 5.7.3.1 Longest Glide Rules

The aim of this task is to climb under power for a set time period before cutting the engine and gliding for as long as possible. A time bonus of 10% is available for landing in the marked square. The dimensions for the marked square are shown in Figure 1.

- (a) The throttle on the engine must be set so that the engine can be stopped on command from the Marshal. Where electric power is used, demonstration that the motor stops when the transmitter stick is fully back must be shown. Also for electric motors, the motor 'brake' must be turned on, so the propeller cannot free wheel when the power is off. Observers will then be watching throughout the flight for the propeller turning to ensure no power is being applied.
- (b) Pilots will take off from inside the square and climb for 15 seconds from wheels off. Climb time may be reduced subject to weather conditions.
- (c) After 15 seconds has elapsed pilots will be instructed by the Marshal to stop the engine. The throttle should then be opened fully and left open for 5 seconds to ensure that the engine has stopped (This does not apply to electric models).
- (d) If one main wheel first touches within the marked square, a bonus of 10% will be added to the time for that round. Touches on the line will be counted, but at the Marshal's and CD's discretion.
- (e) The pilot with the longest total time will be the winner.
- (f) In the event of a tie, there will be a fly-off with a reduced engine run time of 10 seconds.

##### 5.7.3.2 Triple Thrash Rules

The aim of this task is to take-off, perform 3 touch & go's, 3 rolls, 3 loops and another touch and go as fast as possible, in that order.

- (a) All touch & go's must be within the marked square (Ref Figure 1). Touches on the line will be counted, but at the Marshal's and CD's discretion. All touch and go's must be flown in the same direction
- (b) All loops and rolls will be judged by the CD and Marshals as compliant with the rules. Pilots must complete vertical inside loops and complete horizontal rolls.

*cont/...*

- (c) A circuit and landing must be performed after the last touch & go. Timing will not stop if the model does not leave the ground and complete a circuit following the final touch.
- (d) Timing will start from wheels off and finish when at least one of the main wheels touches the ground on the last touch & go.

### 5.7.3.3 Spins & Spot Rules

The aim of this task is to perform as many spins as possible after using a total 'power on' time of 30 seconds, to climb. A spot landing bonus is also available on landing.

- (a) The pilot will take-off from inside the marked square. The 'power on' time of 30 seconds will then start from wheels off.
- (b) The 'power on' time of 30 seconds cannot be used in one go, with no single power on climb to be longer than 15 seconds. The pilot may use it in parts to his or her choosing, i.e. the pilot may climb for 15 seconds, spin the model, climb for a further 10 seconds before spinning the model again. The remaining 5 seconds may then be used to help return to the square
- (c) 'Power on' time is used whenever the throttle stick is moved from its' bottom stop. (Idle). A slow idle should be demonstrated before take off. Slow idle will be deemed as a setting that will not provide an advantage to the pilot when returning to the square. This will be at the CD's discretion.
- (d) After the 30 seconds 'power on' time is used up, the pilot may not open the throttle from its' bottom stop again. Using more than 30 seconds to climb in any allowed combination will result in disqualification from the task, but on landing, following the final spin and once all the power on time has been used up, should the pilot open the throttle from its' bottom stop again, the landing bonus will not be counted, but the spins will still be allowed.
- (e) The 30 seconds will be counted down every 5 seconds, then every second for the last 5 seconds.
- (f) Should the engine stop before all 30 seconds 'power on' time have been used, no engine re-start will be allowed.
- (g) 5 points will be awarded for every complete spin. A spin is defined as the model descending in a stall and rotating using input from rudder, elevator and aileron. Spiral dives are not allowed.
- (h) The landing score will be wherever a main wheel first touches in the marked square, as shown in figure 2. The maximum score being 100 points for the centre square, 80 points for the second square then 60 and finally 40 for the outer square. Whichever wheel touches first will be taken as the score and if that wheel lands on the line between two scoring zones, the higher of the two scores will be taken.
- (i) The overall score will be the points awarded for the spins added to the landing score. In the event of a tie, there will be a fly-off with a reduced 'power on' time of 15 seconds.

### 5.7.3.4 Limbo Rules

The aim of this task is to complete the highest number of clean passes through the limbo gate within 2 minutes. A clean pass will be scored if the model passes under and in between the tapes that form the limbo gate without touching the ground or cutting the tapes. The gate dimensions are shown in Figure 3.

- (a) The pilot must take-off safely away from the gate into wind. The helper must retire immediately from the gate, but be ready to retrieve the model if the engine cuts.

*cont/...*

- (b) Timing will commence when the pilot performs a nominated starting pass over the limbo gate. The amount of practice passes over the top of the gate will be down to the CD's discretion on the day.
- (c) All passes must be in the same direction. Touching the ground before, under or after the tape will not count as a limbo
- (d) If the engine cuts during the flight, it may be re-started and the task continued but the clock will not be stopped.
- (e) If the tapes that form the limbo gate are cut, only the clean passes up to that point will count. The pass cutting the tape does not count.
- (f) In the event of a tie, a fly-off will take place, but only over 1 minute.

### 5.7.3.5 Touch & Go Rules

The aim of this task is to complete the highest number of touch & go's in the marked square as possible within 2 minutes (Ref Figure 1).

- (a) Pilots must take-off into wind from inside the marked square.
- (b) Timing will start from wheels off.
- (c) All touch & go's must be flown in the same direction. To qualify as a touch & go, at least one main wheel must first touch within the square, (they may roll across the line after touching within the square), and then lift off. Touches on the line will be counted, but at the Marshal's and CD's discretion.
- (d) If the engine cuts during the flight, it may be re-started and the task continued but the clock will not be stopped.
- (e) In the event of a tie, a fly-off will take place, but only over 1 minute.

### 5.7.3.6 Deadstick Aerobatics Rules

The aim of this task is to climb under power for a set time period before cutting the engine and performing as many loops or rolls as possible. A bonus of 10% is available for landing in the marked square. The dimensions for the marked square are shown in Figure 1.

- (a) The throttle on the engine must be set so that the engine can be stopped on command from the Marshal. Where electric power is used, demonstration that the motor stops when the transmitter stick is fully back must be shown. Also for electric motors, the motor 'brake' must be turned on, so the propeller cannot free wheel when the power is off. Observers will then be watching throughout the flight for the propeller turning to ensure no power is being applied after the climb. We understand that in a dive the propeller might turn slightly, so common sense will be used when observing.
- (b) Pilots will take off from inside the square and climb for 15 seconds from wheels off. Climb time may be reduced subject to weather conditions.
- (c) After 15 seconds has elapsed pilots will be instructed by the Marshal to stop the engine. The throttle should then be opened fully and left open for 5 seconds to ensure that the engine has stopped (This does not apply to electric models).
- (d) Pilots will be awarded 10 points for every complete vertical inside loop and 3 points for every complete horizontal roll. The loops and rolls will be judged by the Marshals and CD as being compliant with the rules
- (e) If one of the main wheels first touches within the marked square, a bonus of 10% will be added to the score for that round Touches on the line will be counted, but only at the Marshals' and CD's discretion.
- (f) In the event of a tie, there will be a fly-off with a reduced engine run time of 10 seconds.

### 5.7.3.7 Touch & Go Bang Rules

The aim of this task is to burst as many of the balloons and complete the highest number of touch & go's in the marked square as possible within 2 minutes (Ref Figure 4). This can be done in any combination the pilot wishes

- (a) Pilots must take-off into wind from inside the marked square.
- (b) Timing will start from wheels off.
- (c) All passes must be flown in the same direction.
- (d) Pilots will be awarded 10 points for every balloon burst and 1 point for every touch & go. Balloons will only count if the model's wheels are off the ground. Taxiing into balloons or sticks will not count. The balloon must be burst by the model, so breaking the stick or knocking the balloon off and it then bursting on the ground will not count either. To qualify as a touch & go, at least one main wheel must first touch within the square, (they may roll across the line after touching within the square), and then lift off. Touches on the line will count, but at the Marshal's and CD's discretion.
- (e) If the engine cuts during the flight, it may be re-started and the task continued but the clock will not be stopped.
- (f) In the event of a tie, a fly-off will take place, but only over 1 minute.

### 5.7.3.8 Water Carrying Rules

The aim of this task is to have a small cup of water attached to your model, then take off, fly a normal circuit and land while trying to keep as much of the water in the cup as possible.

- (a) Pilots must take off safely into wind, once the cup has been filled with water.
- (b) A big circuit (to be advised by the CD at the competition) must then be flown and then the model landed in front of the pilot.
- (c) The amount of water will then be measured. The pilot with the most water left in the cup will be the winner.
- (d) The score will be doubled if a loop is completed at any time during the circuit.

### 5.7.3.9 Doughnut Drop Rules

The aim of this task is to fly over the marked square as described in figure 2 carrying a rubber ring slid over an attached pole (supplied by the CD), which is attached to your model, then drop the ring (doughnut) on the square. Points are awarded for getting the rubber ring as close to the centre of the square as possible.

- (a) The supplied pole is 10cm in length and can easily be attached to the top of the model before the start of the task. The doughnut (rubber ring) is about 7cm in diameter and has a streamer attached. It is slid onto the vertical pole before takeoff.
- (b) Pilots must take off into wind and then, when told it is safe to do so by a Marshal, may drop the doughnut onto the target. The doughnut can be dropped in any way, for example by rolling, looping, pushing forward, etc.
- (c) Points are awarded where the doughnut stops and not where it first touches. Maximum points are 100 for the centre square, then 80, 60 and 40 for the outer square. Missing the square entirely is zero points. If the doughnut lands on the line between two scoring zones, the higher score will be taken.
- (d) Each pilot has three drops, landing to get another doughnut after every drop, i.e. only dropping one at a time. The total score will be the three drops added together.

### 5.7.3.10 Roop Rules

The aim of this task is to complete as many pairs of a roll and a loop as possible within 1 minute.

- (a) Pilots must take off from the marked square in figure 1, into wind. Time will start from wheels off and will be counted down every 10 seconds and then every second for the last 10 seconds.
- (b) Once in the air, the pilot should complete as many pairs of a roll followed by a loop as possible in the minute allowed. A roll must be horizontal and a loop must be a normal vertical inside loop. All loops and rolls will be judged by the Marshals and CD as being compliant with the rules.
- (c) Each completed pair is worth 1 point, the winner being the pilot with the most points.
- (d) The pilot must land, touching a main wheel first back in the marked square before the minute is up. If the pilot is still flying and has not touched in the square when the minute is up, a penalty of 2 points per second over time will be deducted from the score.
- (e) In the event of a tie, there will be a fly off with a reduced time of 30 seconds.

### 5.7.3.11 Touch & Go Pylon Race Rules

The aim of this task is to fly 5 laps between a marked distance (pylon) and the marked square in figure 1 in the fastest time while undertaking a touch & go on each lap (see figure 5).

- (a) The pilot must take off from inside the marked square and fly a marked distance (100 m) to a pylon.
- (b) The distance is deemed to have been achieved when the flag man at the pylon drops a flag. If the turn is completed before the flag has dropped (i.e. the turn is anticipated too early), then the model must return to the pylon and complete the distance until the flag has dropped.
- (c) The flag man will use a sighting pole to judge the distance and will only drop the flag when the model has clearly crossed the line. The model does not need to fly around the pylon, only complete the distance.
- (d) The pilot may have a helper to call when the flag has dropped, at which point the pilot turns the model and flies back to the marked square.
- (e) On returning to the start point (marked square), the model must change direction again and perform a touch and go in the marked square in the same direction as the model took off, i.e. facing the pylon. To qualify as a touch & go, at least one main wheel must first touch within the square, (it may roll across the line after touching within the square), and then lift off. Touches on the line will be counted, but at the Marshal's and CD's discretion.
- (f) If the model touches outside the marked square, the pilot must re-attempt the touch and go in the same direction until a valid touch and go in the square is completed. The pilot will be told when the touch and go is valid. That is then the end of the first lap and the model then flies off back to the pylon which starts the second lap.
- (g) Time will start from wheels off at the start and finish when the fifth touch and go is completed. Following the final touch and go the pilot must be able to fly a circuit and land. The winner will be the pilot that completes the five laps in the shortest time.
- (h) In the event of a tie, there will be a fly off over three laps.

### 5.7.3.12 Wild Card Rules

- (a) Each competitor in either Class 1 or 2 will be allowed one 'wild card' flight during the competition. The 'wild card' enables a pilot to re-fly any one task during the time allocated to that particular task. A pilot must inform the CD of his intention to use the 'wild card' at which point the pilot's original score for that task will be scrubbed. All wildcards must be played at the end of the particular task after all the pilots have flown once.
- (b) The flight order for the wildcard round will be in reverse order of the task results.
- (c) The 'winning pilot' may wait to see the result of all the other competitors wildcard flights before deciding to play his wildcard.
- (d) In the event of a high number of entrants or bad weather, the wild card rule might be abolished for the duration of the competition.

### 5.7.4 Task Scoring

The winner of each task will be given 100 points. The other pilots will score on a percentage basis according to their performance

eg.: Winner of Longest Glide = 10 mins = 100 points  
Second place = 8 mins = 80 points

The following formula is used:

$$\text{Points}_X = \frac{S_X}{S_W} \times 100$$

Where PointsX = points awarded to competitor X.  
SX = score of competitor X.  
SW = score of winner of round.

For instance, the winner of longest glide scores 10 minutes (600 seconds) and a runner-up scores 8 minutes 25 seconds (505 seconds):

The winners score will be 100 points while the runner up's will be ;

$$\frac{505}{600} \times 100 = 84 \text{ points}$$

As another example, in the Touch and Go task, if the winner does 16 touch and goes and a runner up does 11.

The winner's score would be 100 points and the runner up's would be;

$$\frac{11}{16} \times 100 = 69 \text{ points}$$

The individual competition scores will be added together to get the overall total. The pilot with the most overall points in each class will be the winner

### 5.7.5 Pilot Rules for All Tasks

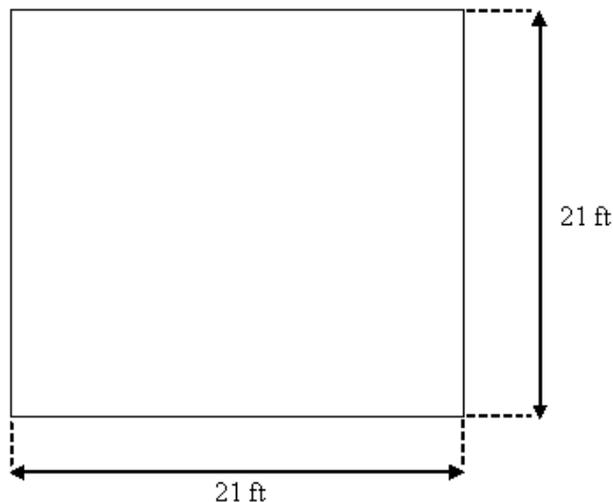
- (a) Every pilot must have a helper for all flights. No helper = no flight.
- (b) The model must be returned to the pits area immediately on completion of the flight and for 35Mhz transmitters, the frequency peg and transmitter returned to the official compound.

*cont/...*

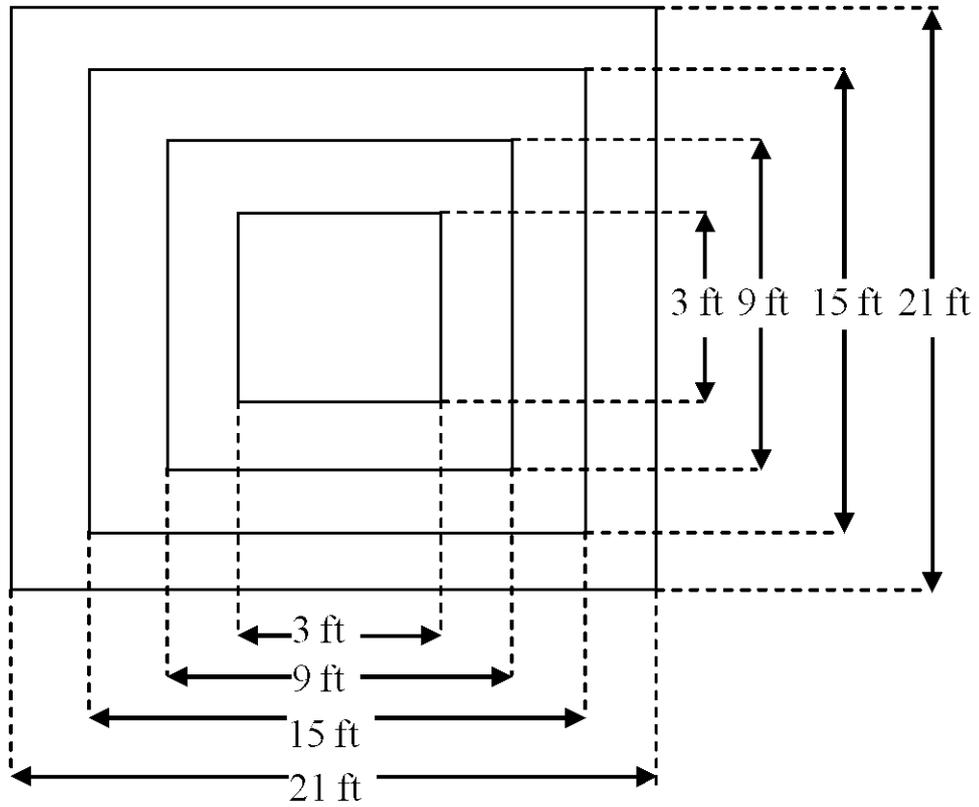
- (c) Hard Hats must be worn by pilots, helpers and marshals when they are out on the flightline. Individuals should supply their own hard hats (PPE) and satisfy themselves that they meet any such standards to provide adequate protection during the competition.
- (d) The CD, in consultation with a minimum of two Marshals will judge all competitions. The CDs' decision is final!
- (e) A 30 minute trimming session will be made available to test and trim models at the start of the day. This should be completed as quickly as possible to allow enough time for everyone to fly and is not to be treated as a practice session. A helper must accompany the pilot during the flight.
- (f) Pilots must attend pilots briefing at the beginning of the day.
- (g) If any model is considered by the CD to be unsafe to fly, it will be grounded. Dangerous flying will result in immediate disqualification.
- (h) Each pilot must use the same model for each competition.
- (i) All pilots must take-off in a safe manner into wind. Whilst airborne, the pilot must be between the model and the spectators/other pilots.
- (j) Every model must have coloured tape applied to each wheel to help with the judging of some competitions. This tape will be available from the CD at the beginning of the competition.
- (k) Failsafes will be checked at the beginning of the competition but it is the competitor's responsibility to make sure it is set correctly. Model eligibility may also be checked at this time or at any time over the duration of the competition.

## 5.7.6 Diagrams

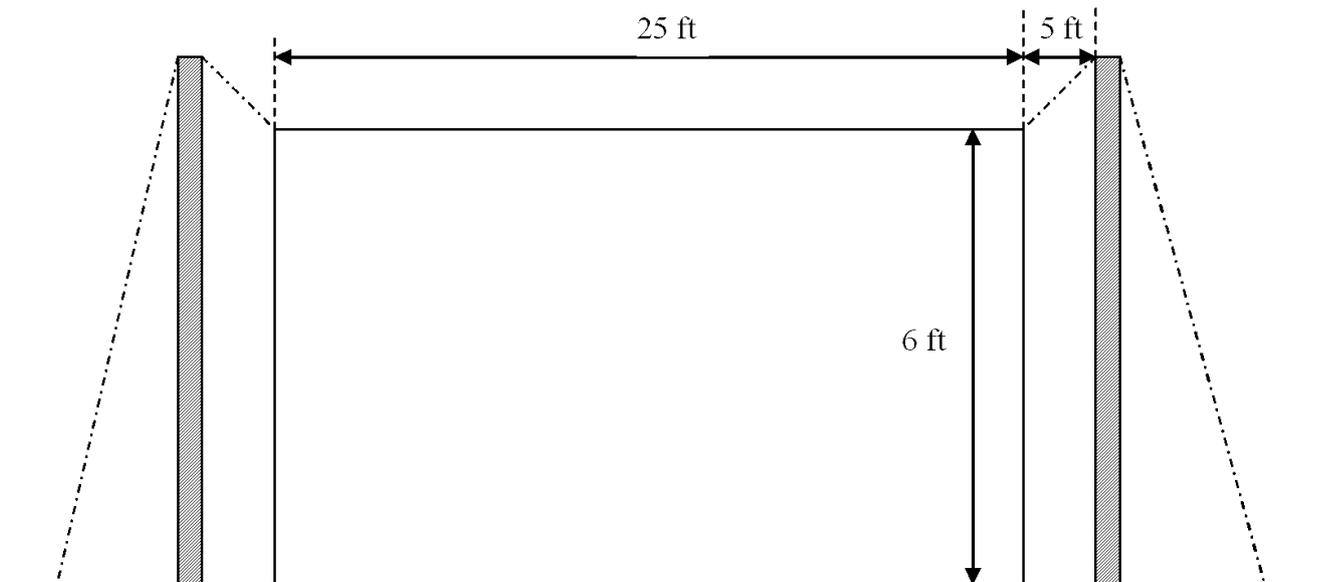
### 5.7.6.1 Dimensions of Marked Square



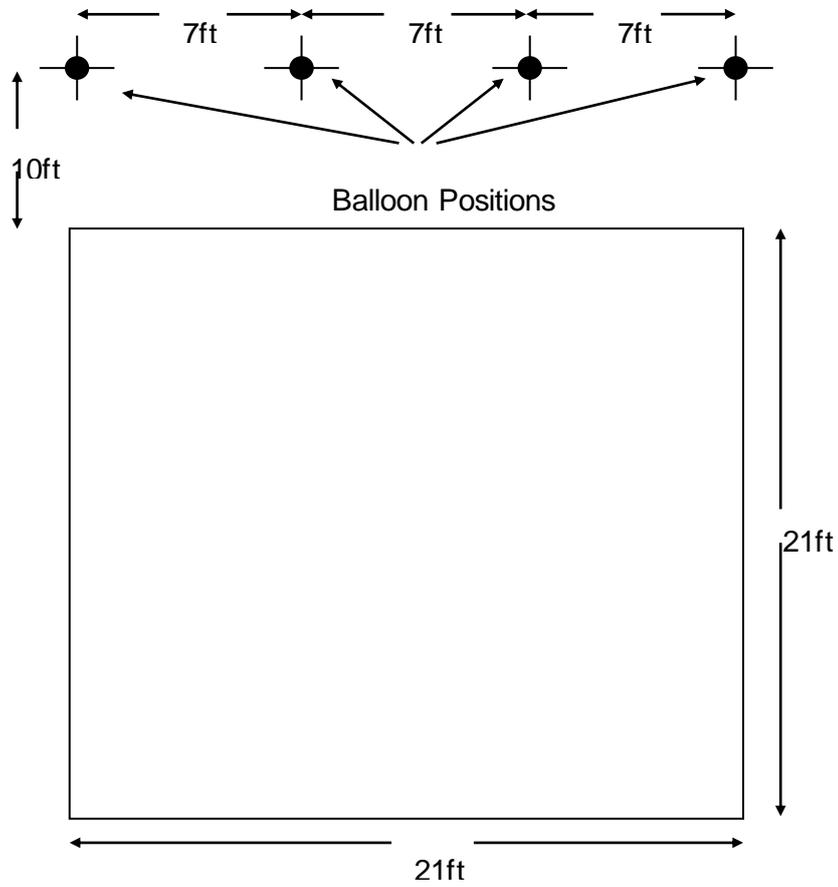
**5.7.6.2 Dimensions of Marked Square for Spins & Spot and Doughnut Drop**



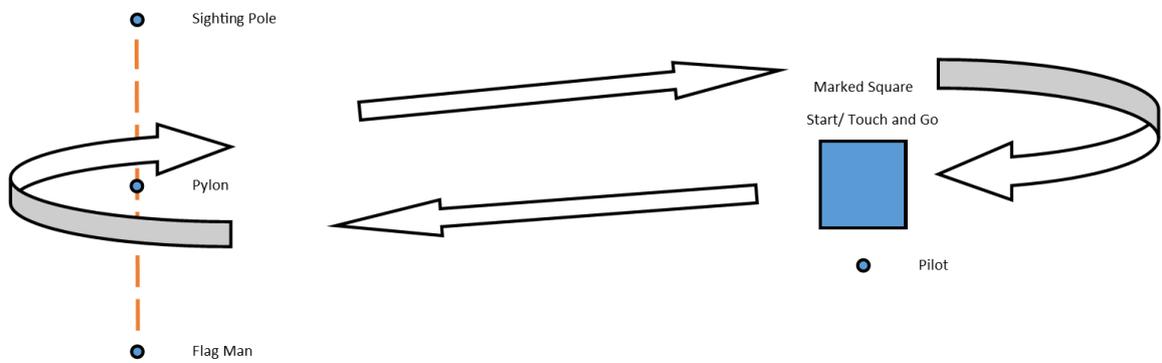
**5.7.6.3 Dimensions of Limbo Gate**



### 5.7.6.4 Touch and Go Bang Layout



### 5.7.6.5 Touch and Go Pylon Layout



## 5.8 F9U R/C Drone Racing

with acknowledgements to  
the British Drone Racing Association

### 5.8.1 General

#### 5.8.1.1 Objective

To provide a consistent set of rules for BMFA-sanctioned drone racing competitions.

#### 5.8.1.2 BMFA Competitions

BMFA F9U Team Selection competitions  
BMFA National Championship

#### 5.8.1.3 Conduct & Disqualification

All BMFA and CAA regulations covering the competitor, drone and equipment shall be applicable to any competition run in accordance with these rules. Consideration of the safety of spectators, contest personnel, and other contestants is of the utmost importance. Flying over a controlled spectator area will result in immediate disqualification of the flight. Further infractions in the competition by that pilot will result in the disqualification from the contest. Unsportsmanlike conduct will not be tolerated and if reports of such behaviour are upheld then the competitor will be disqualified from the contest.

#### 5.8.1.4 Protests and Appeals

At UK competitions protests and appeals shall be dealt with as per rule 5.0.6 of these rules.

### 5.8.2 BMFA Variations on F9U Radio Controlled Drone Racing

Note: The F9U class rules can be downloaded at <https://www.fai.org/page/ciam-code> or obtained directly from BMFA Head Office.

#### 5.8.2.1 (B.1) General Specifications for Models

##### 5.8.2.1.1 (B.1.7) Identification mark

At UK domestic competitions, the national identification mark and FAI Sporting Licence ID are not required to be carried on each model.

##### 5.8.2.1.2 (B.4) Model Registration and Processing

The model specification may be changed according to site requirements. If this is the case then the information must be made available at least one calendar month before the competition.

#### 5.8.2.2 Optional and Local Rules

- (a) Local rules, in accordance with General Rule 2.5.4, may apply to any BMFA competition and will be notified to the competitors by the organiser together with announcement of the competition on the *BMFA Contests and Events Calendar* on the BMFA website at least one month in advance of the competition.
- (b) Where the FAI rules provide more than one option for running the contest, the options selected by the contest organiser will be notified no later than the date on which the competition is published on the *BMFA Contests and Events Calendar* on the BMFA website.

## 5.8.3 F9U Team Selection

### 5.8.3.1 Competitions

(a) Team Selection competitions for F9U shall be run in accordance with the current FAI Sporting Code and relevant BMFA variations and are under the control of the British Drone Racing Association acting on behalf of the BMFA. A minimum of three BMFA Team Selection competitions will be scheduled in any selection series.

(b) Additionally if any recognised FAI F9U World Cup Events are run in the UK then the results of one of these can also count towards a pilot's team selection score provided that event is duly nominated as such and properly advertised as a Team Selection Event in the BMFA Contests and Events Calendar. World Cup Events require the pilots to hold a valid FAI licence and this event therefore must not be the only team selection event scheduled.

***Note that for the 2021 calendar Team Selection schedule, points gained at the 2019 Barkston Heath British National Championships F9U World Cup Event can also be considered alongside all other scheduled team selection events.***

(c) If three team selection competitions or fewer are held, then the Team Selection ranking will be calculated from the total sum of each competitor's scores from these three events. If more than three competitions are held then the three best scores for each competitor from the series of Team Selection Events will be counted towards the Team Selection ranking.

(d) If two or more competitors are tied on points then the competitor with the greater number of final-round wins will be awarded the position. If a tie still occurs then the competitor with the greater number of final-round second-places will be awarded the position, and so on until a tie no longer exists. If the tie cannot be broken by considering final-round places alone then the qualifying positions will be considered.

(e) Team Selection competitions shall be notified in the *BMFA Contests and Events Calendar* on the BMFA website at least one month prior to the competition.

(f) In the event that it is not possible to hold or complete the minimum planned Team Selection Schedule due to exceptional circumstances (e.g. a pandemic), the competitors scores from all rounds completed at that point will count towards Team Selection. In the event that it is not possible to hold any of the planned events in the schedule, a specific single Team Selection event may be organised. If it is not possible to achieve this then the last selected team for F9U will be put forward for ratification provided that team was ratified for an event not more than two seasons apart.

### 5.8.3.2 Entry

(a) Pre-entry to F9U Team Selection Events is essential and details of how to enter and the specific entry requirements will be provided at the same time as the competition is published in the *BMFA Contests and Events Calendar*.

(b) Entries cannot be accepted until the competition is published on the *BMFA Contests and Events Calendar* and entry cannot be confirmed until payment is received.

(c) At the CD's discretion and in exceptional circumstances, on the day entries may be permitted but only from eligible pilots and only if there are vacancies below any stipulated entry cap.

### 5.8.3.3 Eligibility

(a) Eligibility to represent the United Kingdom (Team GBR) at European and World Championships will be determined by the Team Selection ranking table.

(b) Competitors must be members of the BMFA in order to be eligible for inclusion in the Team Selection ranking table.

(c) The ranking table will be calculated from each eligible individual's scores as per 5.8.3.1 from all relevant Team Selection competitions. The ranking table will remain valid for Team Selection purposes until the creation of a fresh table is triggered by the first Team Selection Event in a new F9U team selection process.

(d) Qualification for the team will be the highest ranked three eligible competitors in the final score table with the 4th placed competitor being allocated the Reserve team place and the 5<sup>th</sup> placed competitor being allocated the 2<sup>nd</sup> reserve place. Provision may be made for a junior team member in addition to the selected team if the top 3 pilots selected are all seniors. Otherwise the junior team member will be the highest ranking Junior Pilot who accepts the team place.

If one or more of the top pilots declines their place or is unable to attend the Championships, then the next highest pilot in the rankings will be offered a team place, until all the positions have been filled.

### 5.8.3.4 Scoring System

Competitors will be allocated points after each Team Selection competition according to the following formula:

$$\frac{(b + 1 - a)}{b} \times 100 \quad \text{rounded up to the nearest 0.5.}$$

where:

$a$  = competitor's position

$b$  = the number of competitors

eg: the competitor who comes 10th in a field of 36 would receive:

$$\frac{(36 + 1 - 10)}{36} \times 100 = 75 \text{ points}$$

First place is awarded the maximum 100 points.

Last place is awarded the minimum (non-zero) points as determined by the number of competitors. In this example that would be 3 points.

**BRITISH MODEL FLYING ASSOCIATION**

**SMAE Ltd**

**Chacksfield House, 31 St Andrews Road, Leicester, LE2 8RE**

**Telephone - 0116 2440028    Fax - 0116 2440645**

**E-Mail - [admin@bmfa.org](mailto:admin@bmfa.org)    Website - <http://www.bmfa.org>**