# TASK CATALOGUE FOR THE 7TH FAI WPC 2012

### Authority

This Task Catalogue is to be used in conjunction with the Local Regulations. The General Section and Section 10 of the FAI Sporting Code takes precedence over the Local Regulation and Task Catalogue wording if there is ambiguity.

### Clarification

The term “Paramotors” refers to classes PF1, PF2, PL1 and PL2.

## Contents

# 1 Introduction

This catalogue describes tasks which may be set during the 7th FAI World Paramotor Championships 2012. All tasks are approved by the FAI Microlight Commission (CIMA) along with the Local Regulations.

## 1.1 Principles

Good tasks make for good championships, but tasks also drive the design direction for the aircraft. For example, Microlights would soon lose their short field capability if no more precision landing tasks into a 100m deck were given.

Flight planning and navigation tasks develop good pilot skills but they, too, affect the characteristics of competition aircraft so a Director must try to set a reasonable balance between tasks where ultimately speed is the advantage and economy is the advantage. These tasks should be as long as possible, so that pilot skills are tested by having to fly over new and different country.

Competition Directors are cautioned against setting a few complicated tasks in favour of lots of simple ones. It is all too easy for a Championship to end with the minimum of tasks required (S10 4.3.3) and there is nothing more likely to upset pilots than if they think they have not flown enough in a championship to properly demonstrate their skills.

This task catalogue contains a reduced set of well known tasks that have been tested in at least one previous FAI-CIMA Cat I event It is intended to provide a solid competition framework where both competitors and organisers can perform their jobs in a simple way while enjoying the competition. Another goal of this task catalogue is to be compatible with an automated scoring system.

Therefore, a number of design decisions have been taken.

- Ground pictures or markers will never be used for scoring. However, they can still be used to define parts of the circuit that pilots are expected to discover once in flight.
- Pilot declarations will be as simple as possible and always before take-off. No declarations will be required after landing.
- Individual planning will be mandatory in tasks involving navigation, including some economy tasks, so flight planning will be done in quarantine in those cases.
- There are no pure speed tasks, as long as speed is always combined with other goals. However, a modest speed bonus will be scored in most navigation tasks. Also, timing may start at the moment when the pilot receives last minute task details, so the speed score bonus may include planning time.
- Homogeneous scoring criteria have been applied across tasks. This allows for better understanding by pilots and simplifies the job of implementing the scoring system.

Task descriptions are written as the task sheets that will be used during a championship. Each task is written in a single page so that it can be individually printed for the convenience of competitors. They will not be modified before or during the championship, with the only exceptions of the addition of figures or further clarifications.

## 1.2 Task types

Tasks fall into three categories:

**A** Flight planning, navigation estimated time and speed. No fuel limitation.

**B** Fuel economy, speed range, duration. Fuel limited to maximum 15 kg for aircraft flown solo and 22 kg for aircraft flown with two people.

**C** Precision

The proportion of each task to be used is stated in S10, 4.29.3

Any task may be set more than once, either identically or with variations.

Distances should be as long as possible referring to the recommended still air range of the competing aircraft stated in S10 4.17.7.

In any task requiring pre-declaration of speed or elapsed time the Director may set up hidden gates through which the pilot would fly if on the correct flight path. Pilots failing to be checked through such gates or who are observed flying a devious path to adjust timing/speed errors may be penalised. No information will be given at briefing on the existence or whereabouts of hidden gates, or the method by which they are controlled.

# 2 Navigation Tasks

## 2.1 Pure Navigation

Fly the maximum number of turn points and distance with a limited amount of time and return to the airfield.

### Planning

Competitors will be given a list of turn-points. Planning will be done in quarantine but no declaration is needed for this task.

### Take-off

A standard take-off in open window will be performed.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

Pilots will fly to as many turn-points as they wish trying to maximize both number of turn-points and distance.

### Landing

Landing will be performed at the designated deck.

### Scoring

Number of turn-points:

N = Number of turn-points crossed by the pilot
Nmax = Maximum number of crossed turn-points in the class
Qn = 500 * N / Nmax

Distance

D = Distance measured in straight lines between consecutive TPs crossed by the pilot.
Dmax = Maximum distance along turn-points in the class
Qd = 500 * D / Dmax

Total

Q = Qn + Qd
P = 1000 * Q / Qmax

### Task-specific penalties

None

## 2.2 Precision Navigation

Fly a circuit at a constant speed in each leg, estimating arrival times to known turn points.

### Planning

A circuit will be defined by a start (SP) and finish (FP) points, with a small number of intermediate turn points (TP). All turn points will be known before take-off. Legs between consecutive points will normally be straight segments, but some of them may also be well defined arcs of circumference. As an additional aid, the organiser may also give the length of each leg.

Pilots will receive the collection of turn points at a specified start-of-planning time (PT) and will plan their flight individually. PT for each pilot will be published in advance.

Pilots will fill in a declaration sheet indicating their estimated times of arrival to every turn point in the circuit, including the finish point. Estimated times will be given in seconds counted from SP. Pilots will hand their declaration to a marshal before take-off.

### Take-off

The director may choose to tun the task with take off at a designated time or allow pilots to take off immediately after handing their declaration to the marshal.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

After take-off, pilots will fly to the start point (SP) where the clock starts. They will fly each leg at a constant speed that should be consistent with their declarations. The speed in each leg may be different, but it must be constant along each leg.

There will be an undetermined number of hidden time gates along the legs.

There will be a small bonus for speed along the whole course, that may include planning time if briefed..

Navigation ends at the finish point (FP).

| SP | → | AA | → | BB | → | CC | → | DD | → | FP |
|---|---|---|---|---|---|---|---|---|---|---|
| T = 0 | Hidden gates | Ta | Hidden gates | Tb | Hidden gates | Tc | Hidden gates | Td | Hidden gates | T |

### Landing

After crossing FP, pilots will proceed to land. Unless otherwise briefed, they will perform a standard deck landing at their designated decks.

After landing they will secure their aircraft and take their loggers to the download office.

### Scoring

Hidden time-gate score: The difference between the time of arrival estimated by the pilot and the real crossing is the time error for a gate.

Ei = Absolute error in seconds in gate i with a tolerance of 5 seconds and a maximum of 180.
Hi = 180 – Ei (Points obtained in gate i). Time gates not crossed score zero.
Qt = ∑ Hi (Sum of all gate points)

Speed score

Tstart = Time of crossing SP or time when the pilot starts planning (according to briefing)
Tfin = Time of crossing FP
T = Tfin – Tstart
Tmin = Minimum time in the class
Qv = 200 * Tmin / T

Total

Q = Qt * (1 + Qv / 1000)
P = 1000 * Q / Qmax

### Task-specific penalties

100% penalty for backtracking or making 360º turns.

20% penalty for an excessive delay between effective take-off and crossing the start point.

### 2.2.1 Precision Navigation – Declaration Sheet

| Turn-point | Estimated time of arrival in seconds counted from the start point (SP) |
|---|---|
| **SP** | **0 s** |
| | |
| | |
| | |
| | |
| **FP** | |

**Pilot** _____

**Comp. No.** _____ **Team** _____ **Class** _____

**Task No.** _____ **Date** _____ **Time** _____

**Pilot's Signature**

**Marshal** _____

**Marshal's Signature:**

## 2.3 Curve Navigation

Precisely fly the course defined by an arbitrary line drawn on the map, with time estimations and a time limit.

### Planning

Pilots will receive a course drawn on a map.

If the course shows a number of known time gates, then the pilots will estimate their crossing time, counted from the start point.

Before take-off, pilots will hand their declaration to a marshal.

### Take-off

The director may choose to tun the task with take off at a designated time or allow pilots to take off immediately after handing their declaration to the marshal.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

Time will start when the aircraft crosses the start point. Then pilots will precisely fly the course trying to cross the time gates in order at their estimated times. Navigation and timing end at the finish point.

There will be an undetermined number of hidden gates to validate the course. Gates must be crossed in order and proper direction. Crossing the same gate more than once in any direction invalidates the gate. Example: The sequence 1-2-4-3-5-6-5-7 will be evaluated as 1-2-4-6-7, a total of five correct gates.

Time will be measured at the known time gates (TG) and checked against pilot declarations. If a time gate is crossed more than once, time will be extracted from the first crossing.

There will be a small bonus for speed along the whole course, that may include planning time if briefed.

| SP | → | TG1 | → | TG2 | → | TG3 | → | FP |
|---|---|---|---|---|---|---|---|---|
| T = 0 | Hidden gates | T1 | Hidden gates | T2 | Hidden gates | T3 | Hidden gates | T |

### Landing

After crossing FP, pilots will proceed to land. Unless otherwise briefed, they will perform a standard deck landing at their designated decks.

After landing they will secure their aircraft and take their loggers to the download office.

### Scoring

Hidden gate score

Nh = Number of hidden gates in the task
H = Number of hidden gates correctly crossed (crossed once, in order and proper direction)
Qh = 1000 x H / Nh

Known time-gate score (when the course includes known time gates). An expected time of arrival (ETA) to each gate will be calculated based on the pilot's declaration. The difference between the ETA and the real crossing is the time error for a gate.

Ei = Absolute error in seconds in gate i with a tolerance of 5 seconds and a maximum of 180.
Hi = 180 – Ei (Points obtained in gate i). Time gates not crossed score zero.
Qt = ∑ Hi (Sum of all gate points)

Speed score

Tstart = Time of crossing SP or time when the pilot starts planning (according to briefing)
Tfin = Time of crossing FP
T = Tfin – Tstart
Tmin = Minimum time in the class
Qv = 200 * Tmin / T

Total

Q = (Qh + Qt) * (1 + Qv / 1000)
P = 1000 x Q / Qmax

### Task-specific penalties

100% penalty for backtracking or making 360º turns.

20% penalty for an excessive delay between effective take-off and crossing the start point.

### 2.3.1 Curve Navigation – Declaration Sheet

| Time gate | Estimated time of arrival in seconds counted from the start point (SP) |
|---|---|
| **SP** | **0 s** |
| | |
| | |
| | |
| | |
| **FP** | |

**Pilot** _____

**Comp. No.** _____ **Team** _____ **Class** _____

**Task No.** _____ **Date** _____ **Time** _____

**Pilot's Signature**

**Marshal** _____

**Marshal's Signature:**

## 2.4 Navigation with Unknown Legs

Fly a circuit discovering one or more legs while in flight.

### Planning

Competitors will be given a series of headings to follow or lines drawn on a map or a description of the procedure to draw them. The start point (SP) and finish point (FP) will always be known.

They will also receive photos of ground features or description of canvas markers: each one indicates the start of a leg. There will be no out-of-track (false) photos or markers.

Planning will be done in quarantine and pilots will declare their planned speed along each known leg.

Before take-off, pilots will hand their declaration to a marshal.

### Take-off

The director may choose to tun the task with take off at a designated time or allow pilots to take off immediately after handing their declaration to the marshal.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

After take-off, pilots will fly to the start point (SP) where navigation starts. They will fly the circuit discovering legs as they fly. They will fly known legs at their declared speed.

There will be an undetermined number of hidden gates along the legs.

There will be a small bonus for speed along the whole course, that may include planning time if briefed..

Navigation ends at the finish point (FP).

### Landing

After crossing FP, pilots will proceed to land. Unless otherwise briefed, they will perform a standard deck landing at their designated decks.

After landing they will secure their aircraft and take their loggers to the download office.

### Scoring

Hidden gate score

Nh = Number of hidden gates in the task
H = Number of hidden gates correctly crossed (crossed once, in order and proper direction)
Qh = 1000 x H / Nh

Hidden time-gate score (when briefed). An expected time of arrival (ETA) from the start of each leg to the hidden gate will be calculated based on the pilot's declaration. The difference between the ETA and the real crossing is the time error for a gate.

Ei = Absolute error in seconds in gate i with a tolerance of 5 seconds and a maximum of 180.
Hi = 180 – Ei (Points obtained in gate i). Time gates not crossed score zero.
Qt = ∑ Hi (Sum of all gate points)

Speed score

Tstart = Time of crossing SP or time when the pilot starts planning (according to briefing)
Tfin = Time of crossing FP
T = Tfin – Tstart
Tmin = Minimum time in the class
Qv = 200 * Tmin / T

Total

Q = (Qh + Qt) * (1 + Qv / 1000)
P = 1000 * Q / Qmax

### Task-specific penalties

100% penalty for backtracking or making 360º turns.

20% penalty for an excessive delay between effective take-off and crossing the start point.

### 2.4.1 Navigation with Unknown Legs – Declaration Sheet

| Known leg | Speed along the leg in Km/h |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

**Pilot** _____

**Comp. No.** _____ **Team** _____ **Class** _____

**Task No.** _____ **Date** _____ **Time** _____

**Pilot's Signature**

**Marshal** _____

**Marshal's Signature:**

# 3 Economy Tasks

## 3.1 Duration

Fly for as long as possible on a limited amount of fuel.

### Fuelling

A standard fuelling operation will be performed. Each class will have a designated amount of fuel.

### Planning

A start point (SP) and finish point (FP) will be given.

No formal planning is necessary for this task.

### Take-off

A standard take-off in open window will be performed.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

After take off pilots will proceed to the start point SP where time starts. As SP can be crossed many times, start time is taken from the first crossing.

Aircraft will try to stay airborne as long as possible.

An aircraft joining another in a thermal shall circle in the same direction as that established by the first regardless of height separation.

Before landing pilots will cross FP where time stops. As FP can be crossed many times, finish time is taken from the last crossing.

### Landing

Landing will be performed inside the designated deck.

Immediately after landing pilots will proceed to the quarantine area where a standard fuel check in quarantine will be performed.

### Scoring

Time score

| | | |
|---|---|---|
| T | = | Time between first crossing of SP and last crossing of FP. |
| Tmax | = | Best time in the class |
| P | = | 1000 * T / Tmax |

### Task-specific penalties

None

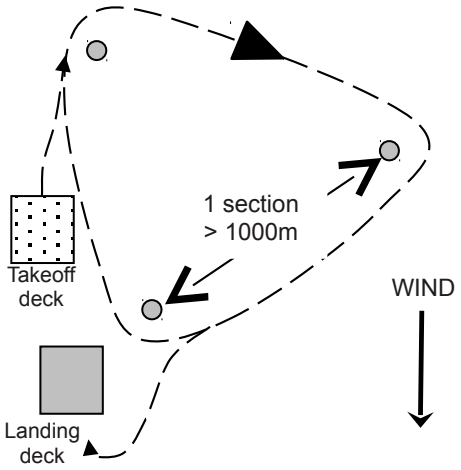
## 3.2 Economy & Distance

### Objective

To take off from the deck with a given quantity of fuel, fly as many sections as possible around a course of one or more sections and land in a landing deck.

### Description

Each section must be longer than 1Km in length and may be much longer.




### Special rules

- Pilots must not exceed 200ft height at any time.
- Exceeding the height limitations or failure of the complete aircraft to round a pylon does not score that section.
- Pilots should overtake on the outside of the course, they may overtake on the inside but will not score that section if the manoeuvre is considered to be overly aggressive.
- If the pilot or any part of his Paramotor touches the ground during the task and takes off again, score zero.
- Failure to land in the landing deck: 20% penalty.

### Scoring

$$\text{Pilot score} = 1000 \times \frac{Lp}{Lmax}$$

Where:

Lp = The number of whole sections completed by the pilot

Lmax = The maximum number of whole sections achieved in the task.

## 3.3 Turn-point Hunt

Fly the maximum number of turn points with a limited amount of fuel and return to the airfield.

### Fuelling

A standard fuelling operation will be performed. Each class will have a designated amount of fuel.

### Planning

Competitors will be given a list of turn-points. Planning will be done in quarantine but no declaration is needed for this task.

### Take-off

A standard take-off in open window will be performed.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

Pilots will fly to as many turn-points as they wish trying to maximize both number of turn-points and distance.

### Landing

Landing will be performed inside the briefed airfield boundaries.

Immediately after landing pilots will proceed to the quarantine area where a standard fuel check in quarantine will be performed.

### Scoring

Number of turn-points:

N = Number of turn-points crossed by the pilot
Nmax = Maximum number of crossed turn-points in the class
Qn = 500 * N / Nmax

Distance

D = Distance measured in straight lines between consecutive TPs crossed by the pilot.
Dmax = Maximum distance along turn-points in the class
Qd = 500 * D / Dmax

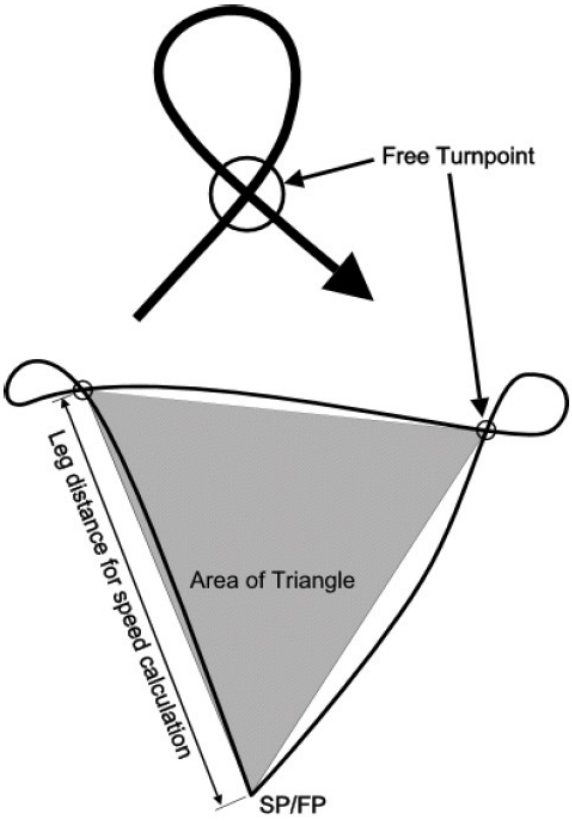
Total

Q = Qn + Qd
P = 1000 * Q / Qmax

Task-specific penalties

None

## 3.4 Area Triangle and Speed




With limited fuel fly a triangular course with the objective of creating a triangle of maximum possible area. The first leg will be score for speed.

### Fuelling

A standard fuelling operation will be performed. Each class will have a designated amount of fuel.

### Planning

A single start and finish point (SP/FP) will be given at the briefing.

No quarantine planning nor declaration is required.

### Take-off

A standard take-off in open window will be performed.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

Pilots will fly a triangle that starts and ends in the SP/FP point. The other two turn-points will be corners of the triangle which the competitors may choose freely. These two free turn-points will be the points where the two consecutive sides of the triangle intersect when a precision turn is flown, so the new leg crosses the previous leg.

The area within the triangle created by SP/FP and the two free turn-points points will be calculated to determine the *triangle area* score.

The first leg, from SP/FP to the first intersection, will be scored for speed. Timing will start at SP/FP and finish at the intersection of the first two legs before the start of the precision turn. Time taken will, therefore, exclude the turn itself.

### Landing

Landing will be performed inside the briefed airfield boundaries.

Immediately after landing pilots will proceed to the quarantine area where a standard fuel check in quarantine will be performed.

### Scoring

Triangle area

| | | |
|---|---|---|
| A | = | Area of the triangle created by the SP/FP point and the first two track intersections. |
| Amax | = | Largest area in the class |
| Qa | = | 700 * A / Amax |

Speed

| | | |
|---|---|---|
| V | = | Speed measured from SP/FP to the first track intersection |
| Vmax | = | Fastest speed in the class |
| Qt | = | 300 * V / Vmax |

Total

| | | |
|---|---|---|
| P | = | Qa + Qt |

### Task-specific penalties

None

## 3.5 Speed Triangle Out-and-Return

With limited fuel, fly around a triangular circuit in the shortest possible time, then fly in a given direction as far as possible and return to the airfield.

### Fuelling

A standard fuelling operation will be performed. Each class will have a designated amount of fuel.

### Planning

Competitors will be given three turn-points, A, B and C.

No quarantine planning nor declaration is required.

### Take-off

A standard take-off in open window will be performed.

Unless otherwise briefed, pilots will perform a standard deck take-off from their designated deck.

### Flight

Pilots will fly to turn-points A, B and C in sequence. Time will be taken from A and C and the difference will score for speed.

After crossing C pilots will fly as far as possible from it. Then they will return to the airfield.

### Landing

Landing will be performed inside the briefed airfield boundaries.

Immediately after landing pilots will proceed to the quarantine area where a standard fuel check in quarantine will be performed.

### Scoring

Speed

| | | |
|---|---|---|
| Ta | = | Time of last crossing of A |
| Tc | = | Time of first crossing of C |
| T | = | Tc – Ta |
| Tmin | = | Shortest time in the class |
| Qt | = | 300 * Tmin / T |

Distance

| | | |
|---|---|---|
| D | = | Distance measured in straight line between C and the most distant point in the track after C |
| Dmax | = | Maximum distance in the class |
| Qd | = | 700 * D / Dmax |

Total

| | | |
|---|---|---|
| P | = | Qn + Qd |

### Task-specific penalties

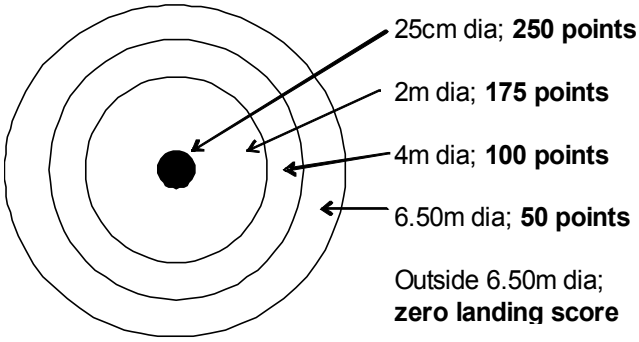
100% of the total score for failing to cross A, B and C in sequence

# 4 Precision Tasks

## 4.1 Precision Take-Off and Landing

### Objective

To make a clean take off at the first attempt in the deck, and subsequently land as near as possible to a target.



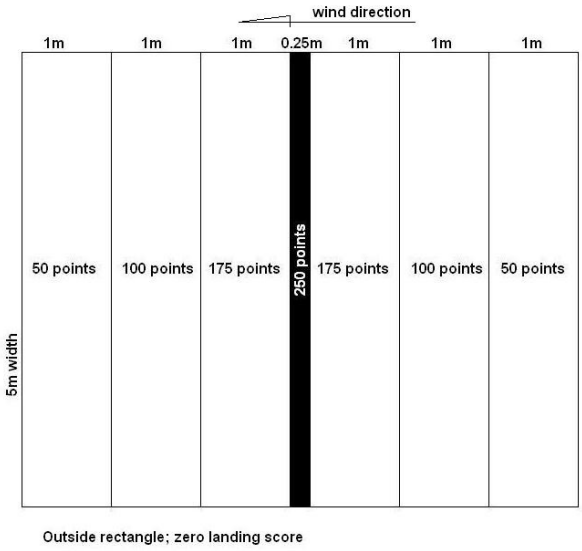

### Description

The pilot is permitted four takeoff attempts, climbs to 500ft overhead the target, cuts the engine before passing through a gate and tries to make a first touch as near as possible to the centre of a target consisting of:

- A series of concentric circles for PF1 and PF2 classes.
- A series of 5m wide parallel strips for PL1 and PL2 classes

### Special rules

- The pilot scores 250 points for a clean take off at the first attempt, 170 for the second, 90 for the third, zero for the fourth.
- The circuit to be flown will be detailed at briefing.
- The first touch of the ground by the pilot's foot (PF) or the aircraft wheels (PL) is the point from which the pilot's score will be derived. A first touch on the line scores the higher score. When more than one PL wheel touches simultaneously, the point chosen is the one in favour of the pilot.
- Contestants will be awarded a zero score if the pilot or any part of the aircraft touching the ground outside the deck while undertaking the task.
- Contestants will be awarded a zero landing score for:
  - Engine not stopped before the gate.
  - Gate not passed correctly.
  - Falling over as a result of the landing.




### Scoring

Bto = Takeoff points
Bld = Landing points
P = Bto + Bld

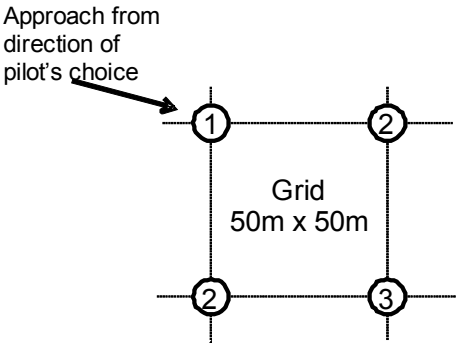
## 4.2 The Four Sticks

### Objective

This task is intended as a small break task between elements of an overall task.

### Description

There are 4 standard kicking sticks set at the corners of a 50m x 50m square. The pilot must kick 3 of the 4 sticks. The first stick the pilot kicks may be any of the 4 sticks. The third stick the pilot kicks must be diagonally opposite the first, the second stick may be either of the two other sticks.




### Special rules

- If this task is used to take a time for the purposes of an element of the overall task then the time shall be taken the moment the pilot strikes the first stick.
- The pilot may have as many attempts as necessary at striking the first stick.
- Only ONE attempt is allowed at kicking both the second and third sticks.
- There shall be one group of 4 sticks for every 15 competitors in the task.
- On approach to the task, pilots should choose a "free" group of sticks. However if, in the opinion of the marshals on duty a conflict with another aircraft existed (depending on the overall task, for example if there is a timing involved) both should kick only one stick and then depart on the rest of the overall task. Both pilots will then be given the opportunity to have ONE further attempt at this task as soon as possible after the end of the overall task.

### Scoring

The scoring should be integrated into the overall task as NQ. If the pilot fails to kick either the second or third stick then for each stick then the penalty shall be no more than 5% of the overall task score.

## 4.3 Precision Take-Off and Landing

### Objective

To make a clean take off at the first attempt in the deck, and subsequently land as near as possible to a target which is:

- A point for PF1 and PF2 classes
- A 5 m long line marked on the ground perpendicular to the wind direction for PL1 and PL2 classes.

### Description

The pilot is permitted four takeoff attempts, climbs to 500ft overhead the target, cuts the engine before passing through a gate and tries to make a first touch as near as possible to the centre of a target.

### Special rules

- The pilot scores 250 points for a clean take off at the first attempt, 170 for the second, 90 for the third, zero for the fourth.
- The circuit to be flown will be detailed at briefing.
- The first touch of the ground by the pilot's foot (PF) or the aircraft wheels (PL) is the point from which the pilot's score will be derived. When more than one PL wheel touches simultaneously the point chosen is the one in favour of the pilot.
- Zero score if the pilot or any part of the aircraft touches the ground outside the deck while undertaking the task.
- Contestants will be awarded a zero landing score for:
- Engine not stopped before the gate.
- Gate not passed correctly.
- Falling over as a result of the landing.

### Scoring

$$\text{Pilot score} = \text{Bto} + \left(250 \times \frac{\text{Dp}}{\text{Dmin}}\right)$$

Where

Bto = Pilot's takeoff score.
Dmin = x - the closest distance to the target achieved by any pilot.
Dp = x - the pilot's distance to the target (> x m = zero landing score).
The value of x, in metres will be given at briefing but may be between 10 and 25 metres depending on the meteorological conditions. This outer zone should be marked by cones or some other visual indication in the form of:

- A circle for PF1 and PF2 classes,
- Two 5m long lines parallel to the target for PL1 and PL2 classes.

## 4.4 Short Take-Off over a Fence

### Objective

To take off and clear a fence from as short a distance as possible. This task is intended to be included as a small element of another task.

### Description

A fence 2m high and 10m long is manoeuvred into a position of pilot choice.

When takeoff permission is granted, pilots takes off and tries to fly over the fence. Maximum distance of pilot's feet on the ground to the fence is scored.

### Special rules

- If the pilot's feet have not left the ground and the line of the fence is not reached at the first attempt then one second attempt is permitted.
- Zero fence score for breaking the fence or weaving.

### Scoring

The scoring should be integrated into the overall task scoring as F. If the pilot fails to clear the fence then the penalty shall be no more than 10% of the overall task score.

$$\text{Pilot score} = \left(100 \times \frac{\text{Fmin}}{\text{Fp}}\right)$$

Where

Fmin = The shortest distance in metres for a takeoff over the fence
Fp = The pilot's takeoff distance to clear the fence.

### Notes

A fence may simply be 2 kicking sticks with a plastic tape between.

To prevent unnecessary delay the fence should only be brought to the pilot when he is ready to take off.

The pilot should not be told the distance he is from the fence, the distance should be at the sole visual judgement of the pilot.

The distance measured is the maximum distance the pilot is away from the fence whilst touching the ground, thus if the pilot steps away from the fence during launch then this distance shall be included.

The job of holding the two poles supporting the fence can be quite hazardous; it should be entrusted to marshals experienced in Paramotor operations.

## 4.5 Precision Circuit in the Shortest Time ('Clover leaf slalom')

### Objective

To strike a number of targets laid out in a given order in the shortest possible time and return to the deck.

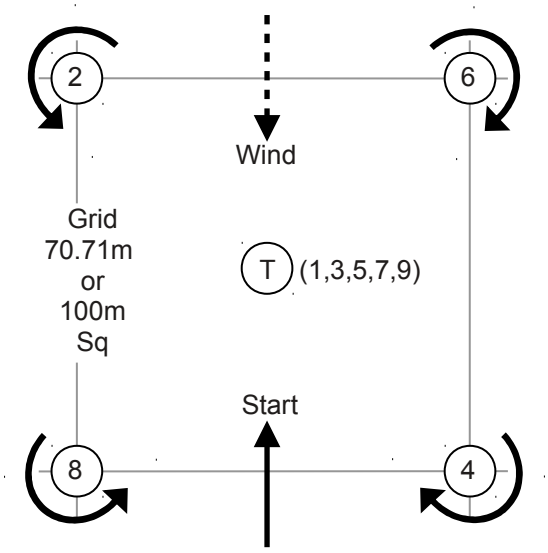
### Description

4 pylons 2m in height are laid out

- At the corners of a 70.71m square for PF1 and PL1 classes.
- At the corners of a 100m square for PF2 and PL2 classes.

A fifth target is set at the centre of the square.

The pilot enters the course into wind and strikes the target T (strike 1). At this point the clock starts. The pilot flies around pylon 2 and returns to kick the stick T (strike 3), he then flies around pylon 4 and returns to kick the stick T (strike 5). This continues until all four pylons have been rounded. The clock stops when target T is kicked for the last time (strike 9).




### Special rules

- A valid strike on the target T is:
  - EITHER one where the pilot or any part of the Paramotor has been clearly observed to touch it.
  - OR when electronic 'kick stick' sensors which have been shown to meet the standard tests are used, a valid strike is one which is recorded by the device.
- To count as a strike, the pilot's body must be clearly seen to round each pylon and pylons 2 & 8 must be rounded in an ANTI CLOCKWISE direction and pylons 4 & 6 must be rounded in a CLOCKWISE direction.
- A strike on target 1 starts the clock, a strike on target 9 stops the clock.
- Pilots may have only one attempt at striking each target except for the first and last targets where three attempts at each are permitted.
- Failure to strike the first or last target or round at least one pylon or touch the ground at any point between them: score zero.
- The grid may be opened up to max. 100M at the briefing if the meterological conditions dictate.

### Scoring

$$t_{pen} = t_{pil} + mv_{pen}$$

$$Q = \ln\left(\frac{3t_{best}}{t_{pen} - t_{best} + 3}\right)$$

Where

$t_{pil}$ = the measured pilots time (seconds)
m = the number of missed targets
$v_{pen}$ = the time penalty for each missed target (seconds)
$t_{pen}$ = the pilots time (after penalties for missed targets)
$t_{best}$ = the best time (after penalties for missed targets)
Q = the task value before normalization

*Note: Spreadsheet formulas:*

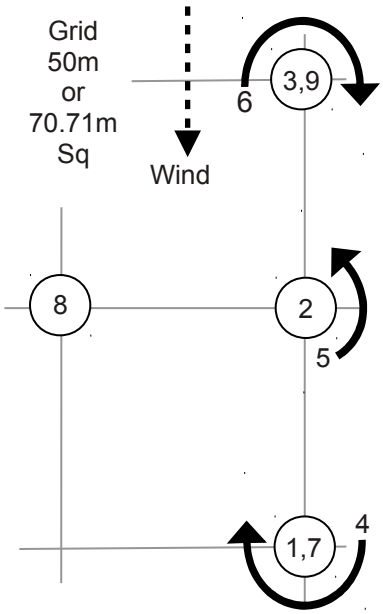
$t_{pen}$ = t_pil + m * v_pen
Q = LOG(3 * t_best / (t_pen – t_best + 3))
or
Q = LOG(3) + LOG(t_best) – LOG(t_pen – t_best + 3)

## 4.6 Precision Circuit in the Shortest Time ('Japanese Slalom')

### Objective

To strike a number of targets laid out in a given order in the shortest possible time and return to the deck.

### Description




4 pylons 2m in height are laid out on

- On a 50 m x 50 m grid for PF1 and PL1 classes,
- On a 70,71 m x 70,71 m grid for PF2 and PL2 classes.

The pilot enters the course into wind and strikes target 1. At this point the clock starts. The pilot then strikes targets 2 and 3. He then returns to fly clockwise around target 1 (strike 4), anticlockwise around target 2 (strike 5) and clockwise around target 3 (strike 6). He then returns to strike target 1 (strike 7), target 4 (strike 8) and target 3 (strike 9). The clock stops when target 3 (strike 9) is kicked.

### Special rules

- A valid strike on a target is:
  - EITHER one where the pilot or any part of the Paramotor has been clearly observed to touch it.
  - OR when electronic 'kick stick' sensors which have been shown to meet the standard tests are used, a valid strike is one which is recorded by the device.
- When targets are acting as pylons, to count as a strike, the pilot's body must be clearly seen to round it, pylons 1 & 3 must be rounded in a CLOCKWISE direction and pylon 2 must be rounded in an ANTI CLOCKWISE direction.
- A strike on target 1 starts the clock, a strike on target 9 stops the clock.
- Pilots may have only one attempt at striking each target except for the first and last targets where three attempts at each are permitted.
- Failure to strike the first or last target or touch the ground at any point between them: score zero.

### Scoring

$$t_{pen} = t_{pil} + mv_{pen}$$

$$Q = \ln\left(\frac{3t_{best}}{t_{pen} - t_{best} + 3}\right)$$

Where

$t_{pil}$ = the measured pilots time (seconds)
m = the number of missed targets
$v_{pen}$ = the time penalty for each missed target (seconds)
$t_{pen}$ = the pilots time (after penalties for missed targets)
$t_{best}$ = the best time (after penalties for missed targets)
Q = the task value before normalization

*Note: Spreadsheet formulas:*

$t_{pen}$ = t_pil + m * v_pen
Q = LOG(3 * t_best / (t_pen – t_best + 3))
or
Q = LOG(3) + LOG(t_best) – LOG(t_pen – t_best + 3)

## 4.7 Precision Circuit in the Shortest Time ('Chinese Slalom')

### Objective

To strike a number of targets laid out in a given order in the shortest possible time and return to the deck.

### Description

Between 6 and 12 targets are laid out on a course not exceeding 3Km in length. Targets are sticks.

The pilot enters the course into wind and strikes target 1. At this point the clock starts.

The pilot then flies the course to strike all the other targets in the given order, a strike on the last one stops the clock.

### Special rules

- A valid strike on a target is:
  - EITHER one where the pilot or any part of the Paramotor has been clearly observed to touch it.
  - OR when electronic 'kick stick' sensors which have been shown to meet the standard tests are used, a valid strike is one which is recorded by the device.
- A strike on target 1 starts the clock, a strike on the last target stops the clock.
- Pilots may have only one attempt at striking each target except for the first and last targets where three attempts at each are permitted.
- Failure to strike the first or last target or at least two of the intermediate targets or touch the ground at any point between them: score zero.

### Scoring

$$t_{pen} = t_{pil} + mv_{pen}$$

$$Q = \ln\left(\frac{3t_{best}}{t_{pen} - t_{best} + 3}\right)$$

Where

$t_{pil}$ = the measured pilots time (seconds)
m = the number of missed targets
$v_{pen}$ = the time penalty for each missed target (seconds)
$t_{pen}$ = the pilots time (after penalties for missed targets)
$t_{best}$ = the best time (after penalties for missed targets)
Q = the task value before normalization

*Note: Spreadsheet formulas:*

$t_{pen}$ = t_pil + m * v_pen
Q = LOG(3 * t_best / (t_pen – t_best + 3))
or
Q = LOG(3) + LOG(t_best) – LOG(t_pen – t_best + 3)

### Note to Director

This task is ideally suited for sites where there are physical features which obscure a direct view from one target to the next.

## 4.8 Fast / Slow Speed

### Objective

To fly a course as fast as possible and then as slow as possible (or vice versa).

### Description

A straight course consisting of four equally spaced 'kicking sticks' between 250m and 500m long is laid out facing approximately into wind.

The course shall be flown twice. The order will be briefed (fast then slow or slow then fast).

The pilot makes a timed pass along the first course, returns to the start, and makes a second timed pass in the same direction.

There may be two courses but they must be of equal dimensions and orientation and separated by at least 200m flying distance.

### Special rules

- A valid strike on a stick is:
  - EITHER one where the pilot or any part of the Paramotor has been clearly observed to touch it.
  - OR when electronic 'kick stick' sensors which have been shown to meet the standard tests are used, a valid strike is one which is recorded by the device.
- For each course, the clock starts the moment the pilot kicks the first stick and stops the moment he kicks the fourth stick.
- The pilot may have 3 attempts at kicking the first stick on each run.
- If the pilot misses the second or third stick then he is considered 'too high', penalty 50% course score for each stick missed.
- The maximum time allowed for a pilot to complete each course is 5 minutes.
- In the slow course;
- If the pilot or any part of his Paramotor touches the ground or the fourth stick is missed: Vp2 = null and Ep = zero
- If the pilot zigzags: Score zero.
- In the fast course;
- If the pilot or any part of his Paramotor touches the ground: Vp1 = zero and Ep = zero
- The pilot may have three attempts at kicking the fourth stick.

### Scoring

$$\text{Pilot score} = \left(125 \times \frac{Vp_1}{Vmax}\right) + \left(125 \times \frac{Vmin}{Vp_2}\right) + \left(250 \times \frac{Ep}{EMax}\right)$$

Where:

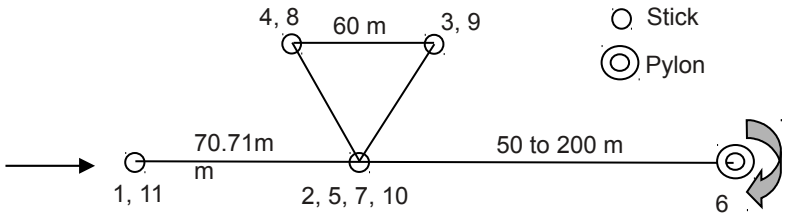
| | | |
|---|---|---|
| Vmax | = | The highest speed achieved in the fast course, in Km/H |
| Vp1 | = | The speed of the pilot in Km/H in the fast course. |
| Vmin | = | The lowest speed achieved in the slow course, in Km/H |
| Vp2 | = | The speed of the pilot in Km/H in the slow course. |
| Ep | = | The difference between the pilot's slowest and fastest speeds, in Km/H |
| Emax | = | The maximum difference between slowest and fastest speeds, in Km/H |

## 4.9 Round The Triangle

### Course description

The course consists of 4 sticks to be kicked and another stick or pylon as a turn point.

The distance from stick 1 to 2 is 70.71 m, the side of the equilaterlal triangle is 60 m, and the distance between stick 2 to turnpoint 6 is 50 to 200 m.




### Flying the course

The pilot enters the course as indicated by the arrow and strikes the first target (strike 1). At this point the clock starts. The pilot flies kicking the sticks in the triangle (strikes 2, 3, 4 and 5), then ckockwise around pylon 6, returns to kick the sticks in the triangle (strikes 7, 8, 9 and 10) and then back to the initial stick (strike 11) The clock stops on strike 11.

### Detail rules

- A valid strike on a target is:
  - EITHER one where the pilot or any part of the Paramotor has been clearly observed to touch it.
  - OR when electronic 'kick stick' sensors which have been shown to meet the standard tests are used, a valid strike is one which is recorded by the device.
- The pilot's body must be clearly seen to round pylon 6 clockwise.
- Pilots may have only one attempt at striking each target except for the first and last targets where three attempts at each are permitted.

### Scoring

$$t_{pen} = t_{pil} + mv_{pen}$$

$$Q = \ln\left(\frac{3t_{best}}{t_{pen} - t_{best} + 3}\right)$$

Where

$t_{pil}$ = the measured pilots time (seconds)
m = the number of missed targets
$v_{pen}$ = the time penalty for each missed target (seconds)
$t_{pen}$ = the pilots time (after penalties for missed targets)
$t_{best}$ = the best time (after penalties for missed targets)
Q = the task value before normalization

*Note: Spreadsheet formulas:*

$t_{pen}$ = t_pil + m * v_pen
Q = LOG(3 * t_best / (t_pen – t_best + 3))
or
Q = LOG(3) + LOG(t_best) – LOG(t_pen – t_best + 3)

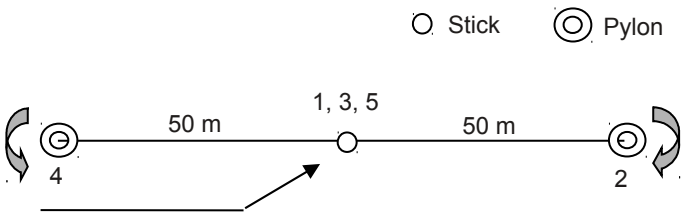
### Penalties.

Touch the ground at any point between first and last strikes: Zero score.
Any part of the aircraft crosses the crowd line or dangerous flying: DSQ

## 4.10 The Eight

### Course description

The courses consists of one central stick and another two sticks or pylons 50 m away on both sides.




### Flying the course

The pilot enters the course as indicated by the arrow and kicks the stick (strike 1). At this point the clock starts. The pilot flies around the pylon ahead of him clockwise (strike 2), then kicks the stick (strike 3), then the other pylon counter clockwise (strike 4) and kicks the stick (strike 5). The course is repeated twice, the clock stops on strike 9.

The course may be flown in a mirror image pattern consistent with the description above.

If briefed, the course may be flown only once, accumulating a total of 5 possible targets.

### Detail rules

- A valid strike on a target is:
  - EITHER one where the pilot or any part of the Paramotor has been clearly observed to touch it.
  - OR when electronic 'kick stick' sensors which have been shown to meet the standard tests are used, a valid strike is one which is recorded by the device.
- The pilot's body must be clearly seen to round the pylons clockwise or anticlockwise as indicated.
- Pilots may have only one attempt at striking each target except for the first and last targets where three attempts at each are permitted.

### Scoring

$$t_{pen} = t_{pil} + mv_{pen}$$

$$Q = \ln\left(\frac{3t_{best}}{t_{pen} - t_{best} + 3}\right)$$

Where

$t_{pil}$ = the measured pilots time (seconds)
m = the number of missed targets
$v_{pen}$ = the time penalty for each missed target (seconds)
$t_{pen}$ = the pilots time (after penalties for missed targets)
$t_{best}$ = the best time (after penalties for missed targets)
Q = the task value before normalization

*Note: Spreadsheet formulas:*

$t_{pen}$ = t_pil + m * v_pen
Q = LOG(3 * t_best / (t_pen – t_best + 3))
or
Q = LOG(3) + LOG(t_best) – LOG(t_pen – t_best + 3)

### Penalties.

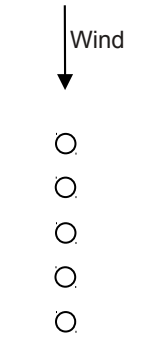
Touch the ground at any point between first and last strikes: Zero score.

Any part of the aircraft crosses the crowd line or dangerous flying: DSQ

## 4.11 Bowling Landing

### Objective

Land without engine, hitting as many pins as possible.




Landing pins

### Description

5 pins are placed along a line into wind in the landing area at regular intervals between 1 and 2 m.

The pins are 50 cm high for PF classes and 100 cm high for PL classes and they are covered by dense foam. They can simply stand on the ground or can be attached to a spring system like that of the kicking sticks. A pin is said to be hit when it is clearly seen by a marshal or electronic sensor, or when the pin falls down.

Pilots will fly to 500ft and cut the engine before crossing a briefed gate.

They will fly a minimum of 60 seconds and will try to hit as many pins as possible before touching the ground. Each pin hit before touching the ground will score 50 points (maximum 250 points).

This task may be combined with a precision take-off.

### Scoring

Pld = 50 points for each pin hit (maximum of 250 points)

### Penalties

Not crossing the gate or crossing it engine on: zero landing score.

Flying less than 60 seconds with no engine: zero landing score.

Falling over during landing or two knees on the ground: zero landing score.

## 4.12 Precision Paraball

### Objective

Deliver three balls into a target or as close as possible to it, in a limited time.

### Description

The target is a basket approximately 1-2m in diameter.

Three balls are placed between 10 and 50m from the target on marked start positions.

After takeoff, the pilot flies to the assigned circuit area and observes the green flag to start.

The pilot approaches a ball, collects it with his feet and carries it to the target. Alternatively the pilot can kick balls towards the target. This is repeated until all the balls are in the target or the time limit is reached.

Timing starts with the touch of the first ball, the first attempt to touch a ball or when passing the first ball. Timing ends when all three balls are in the target or when three minutes has elapsed, whichever comes first.

The time limit is signalled by a marshal with a red flag.

Upon completing the task, the pilot flies to the briefed landing area.

Scoring is based on the time taken to get all three balls in the target, or, if the maximum time limit is reached, the number of balls in the target and the position of the remaining balls outside the target.

### Special rules

There are no limitations to the number, angle, speed or height of approaches to the balls and the technique for moving, hitting, kicking or carrying the balls.

Balls must stay in the target. Balls bouncing out of the target will be scored according to their distance from the target.

Pilot's contact with the ground is permitted, but no part of the wing may touch the ground before the end of the task. Penalty for the wing touching the ground before the end of the task = 4 min elapsed time (zero pilot score).

No part of the pilot or aircraft may touch the target. Penalty for touching the target = 4 min elapsed time (zero pilot score).

If a pilot is carrying a ball at the moment the time limit is reached he may continue to finish the task with that ball until it touches the ground or a total elapsed time of 3 min 30 sec has passed, whichever is first.

### Scoring

| | | |
|---|---|---|
| T | = | pilot elapsed time to get all 3 balls into the target, or 3 minutes, whichever came first. |
| B1 | = | Number of balls moved to within 5m of the target. |
| B2 | = | Number of balls moved from their original starting position. |
| B3 | = | Number of balls still in their original starting position. |
| T1 | = | T + (B1 * 5 sec) + (B2 * 11 sec) + (B3 * 20 sec) |
| Tmin | = | Shortest T1 time. |
| P | = | 1000 * (Tmin / T1) |

### Organizer notes

The optimum target is a hybrid of hole and basket with edges between 20 and 50cm above ground. Construction should be light for safety reasons but strong enough to hold the force of a flying ball and to keep balls inside.

Balls may be the same size or different sizes or colours. The optimum is soft foam balls, but footballs or 'Pilates balls' may be used as available. Balls should always be in quite a soft condition to discourage too much bouncing and to assist collecting of balls with feet.

The starting position of each ball may be any orientation from the target. Upwind is preferred.

A marked 5m circle around the target is a useful aid for pilots and scoring marshals.

*Some reserve balls of identical shape, size and colour should be available. These can be used to speed the 'resetting' of the course and as replacements for any damaged balls.*