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TASK CATALOGUE

Version 4 – 06/2024

FOR THE 2024 BRITISH OPEN PARAMOTOR CHAMPIONSHIPS BRITISH NATIONAL PARAMOTOR CHAMPIONSHIPS GERMAN NATIONAL PARAMOTOR CHAMPIONSHIPS

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The 2024 British Open Paramotor Championships would not be possible without the generous support of our official Championship Sponsors, and the network of BHPA paramotor schools who have supported paramotor competitions in the UK for many years, and who play such an essential role in ensuring the development of the sport, and the skill set and safety of British paramotor pilots.



1. Introduction

1.1 INTRODUCTION

Since 2018, the British National Paramotor Championships have followed the FAI 'Endurance' format, in which the emphasis is on long distance navigation, maximising flying hours for pilots and minimising extensive briefings or complex rules. There are two key objectives to our championship structure: firstly to award trophies to the pilots that demonstrate the highest degree of skill through tasks that accurately represent the flight planning, decision making, and aircraft control necessary to fly paramotors safely and enjoyably; secondly, to promote and encourage pilot skill development, providing a safe and nurturing environment in which pilots at any level can expand their skills by learning from the top pilots in the country.

Fundamentally, the competition is a series of navigational and piloting challenges, many of which can be attempted at any point during the allowed flying hours of the competition, which takes place over a period of several days. Further bonus points can be gained by collecting turn points en route to and from the precision tasks. Pilots are permitted a maximum number of flying hours each day, within a longer flying window that utilises the majority of daylight hours. Pilots may make any number of flights and refuelling stops within each daily flying period. Pilots will normally conclude their day's flying by returning to the airfield; occasionally an alternative final landing point may be briefed if windy conditions dictate. Careful flight and weather planning across the period of the competition is therefore essential, as is equipment selection to maximise the distance/fuel economy balance of long distance flight.

Key features of the paramotor endurance format are:

- Large competition map area (in 2024, approximately 4,000 km²), with minimal restrictions and no-fly zones.
- Many hours flying over spectacular and varied terrain (pilots in 2023 flew approx. 12 hours XC)
- A strong focus on strategic flight planning, airborne decisions and practical paramotoring and piloting skills.
- Free choice of flight windows up to a maximum (specified) limit of airtime hours per day, within a larger task window that utilises the majority of daylight hours.
- Minimum of briefings and penalties.
- Simple and fast scoring, using live GPS tracking to follow pilots.
- Pilots score points through a range of task types:
 - Precision navigation by following prescribed routes accurately in both positional and speed control
 - "Collecting" turn points en route to and from other tasks
 - Flying economically, through choice of equipment, throttle management and/or use of thermic air
 - Precision wing control in accurate landing or ground-based tasks.

1.3 CHAMPIONSHIP CLASSES

Competitors may enter in the following classes:

PF1: Solo Foot-launched
Paramotor

PF1f: Solo Foot-launched
Paramotor Female
(valid with minimum 4 female
pilots)

PL1: Solo Paramotor Trike

1.4 COMPETITION MAPS

One full set of colour printed competition maps will be provided to each competitor. The following features will be indicated on the official competition map:

AF: Airfield.

Does not score as a turnpoint unless also briefed as a precision landing task.

TP: A standard turnpoint to be flown through, defined by a circle of 250m radius centred on a map feature.

Landing here is forbidden and invalidates the score. Score value of turnpoints is increased by distance from the airfield, and the values of each will be clearly indicated on the map by the number of concentric rings centred on the feature. Pilots may only score each turnpoint once during the competition.

SL/FL: The start/finish line is a line between two clearly-defined features or along a linear feature on the map close to the airfield. All pilots must pass through one of these on their outbound climb and inbound landing approaches in order to activate and then stop their flight allowance timer for all tasks. There is no score for passing through them; but for pilots who land without having passed through an SP/FP on both their outward and return flights, their flight times will be computed from take-off and landing on the airfield itself, and a 20% penalty will be applied to all points scored on that flight. If there is more than one SP/FP defined, they can be used independently. For example, in any single flight, a pilot might activate their time by passing SP/FP1, but they may return through either SP/FP1, or SP/FP2, according to their personal flight plan.

In between crossing the SL and FL a pilot is considered to be 'on task' and must fly above minimum height of 500 feet (150m) above ground level at all times unless outlanding. A 20% penalty will be applied to the total score for that flight, for each incursion below minimum height that lasts longer than 5 seconds in sequence. If the period of time below minimum height is longer than 5 minutes, the penalty is increased to 50%.

FD: A Fuel Depot point.

Marshal-controlled refuelling point. Pilots shall bring adequate spare fuel containers to provide marshals with reserves before flying each day. Performing a normal landing at these points will score the same as with turnpoints. FD points may also contain a precision landing task, if briefed. There will be a maximum of two of FD points.

HG: A Hidden Gate.

Hidden Gates are a straight line 250m wide perpendicular to the briefed track (i.e. 125m to each side). They are used for scoring navigation or timing accuracy as per tasks 2.1, 2.2, and 2.3

NFZ: No-Fly Zone.

This may be CAA restricted airspace, or additional local restrictions. Incursions will typically incur a 50% reduction in the points scored for that day's flying, or more at the discretion of the director.

Pilots must fly only with the maps provided or the CAA air map and may not use any additional navigation aids, apart from a magnetic compass.

1.6 BRIEFINGS, TASK WINDOWS, AND FLYING HOURS

The intention of this format is to minimise the number and length of competition briefings. The first briefing will take place online (via Microsoft Teams), one week in advance of the championship, at 20:00 BST on Wednesday 12 June. All essential information relating to the tasks, the map area, the flying site and local rules will be given at this briefing, with the exception of the detailed precision route maps. This briefing will be recorded for pilots who cannot attend. Competitors may start arriving on site from Monday 17 June. The first on-site briefing will take place at 20:00 BST on Tuesday 18 June, the evening before the first day's flying. Detailed printed competition route maps will be distributed at this briefing.

Short 'top-up' briefings will be held after flying concludes on each day of the competition thereafter, at which further specific information relating to the following day's flying will be given. According to requirements of weather or other factors, additional briefings may still be called at other points during the competition if necessary.

Competition flying will normally take place between 07:00 and 21:00 daily, throughout each day of the competition. Shorter windows for particular activity or task types within this period will be briefed.

A maximum total number of XC airtime hours a pilot may fly for any particular competition day will be defined by the director at the evening briefing the night before. This will be based on weather forecasts, and will be no more than five hours in any one day.

Airtime will be computed automatically from the GPS track, and there will be a penalty for exceeding this. The computation of airtime shall be defined as the time between the first time a pilot crosses one of the defined SP/FP points after take-off, and the final time that they pass an SP/FP point before landing. This rule is in place for safety reasons, because it removes any incentive to rush a landing approach in order to avoid penalties for a late return. For pilots who fail to cross the SP/FP on either their outbound or return flights, their flight time will be computed from the precise moments of take-off and landing at the airfield, and all points gained on that particular flight will be subject to a 20% penalty.

1.7 FUELLING

Competitors wishing to use the option to refuel at the FD (Fuel Depot) zones (if available) during the tasks should bring their own containers to the championship which they can give to the marshals who will be on duty in the FDs. There will be a maximum of one FD designated for any particular day's flying.

For any particular flying day, the director may brief a maximum limit to the amount of fuel that can be used (as per task 2.5). When such a task is defined, landings and take-offs will only be performed at the Airfield, i.e. where marshals can monitor pilots during refuelling. When fuel is limited in this way, the amount of fuel will be specified by the director at the briefing. The amounts of fuel allowed may be different for each competition class.

Fuelling to the specified limit will be done under supervision of marshals and fuel tanks will be sealed by marshals before flight.

At the airfield, all refuelling of paramotors is to take place ONLY in the designated refuelling area.

1.8 LANDINGS / OUTLANDINGS

During the tasks, pilots may land in the Airfield, or in FD (Fuel Depot) points to refuel. Any of these landings may be used as a rest break or a pause for strategic reasons, but the pilot must eventually take off again from these points and continue their flight, finally returning to the airfield (or such other final landing point as defined in the briefing) to complete the days tasks, in order for these not to count as an outlanding.

Pilots are expected to conclude their day's tasks by landing back at the airfield, or another final landing point if defined in the briefing. Failure to do so, or landing at any point not designated as a landing zone, will be considered an Outlanding.

Outlandings as described above shall result in a 50% reduction in the points scored up to the point of landing during that flight. For these purposes, a "flight" is considered to be an outward and return journey starting and finishing at the base airfield (i.e. landing at a fuel depot does not start a new "flight"). This penalty is applied to points scored on all navigation tasks (2.1, 2.2, and 2.3 and 2.4) attempted during the same flight.

If a pilot lands out with an engine or other problem during the task, they may, within the flying window, and if it is safe to do so, repair their aircraft, and continue flying to score more points for the day. These points will not be subject to any further penalty. Pilots may return to the airfield to make these repairs if necessary and if transport is available. When resources allow, roving marshal teams in vehicles will be assigned to assist with retrievals.

If a pilot has an outlanding, they must inform the organisers by telephone, with the minimum of delay and at the latest by the closing time of the task. If carrying a basic mobile phone, they may do this without further penalty on top of the 50% for the outlanding. If the aircraft can be repaired in the field, a pilot may take off again and continue the task without further penalty. If they need to break the seal on either a smartphone (or the fuel system, if defined), the 50% penalty applies to all points scored up to the point at which the phone is re-sealed by a marshal.

Upon outlanding, a pilot must fold up their canopy within three minutes of landing. A canopy that has not been folded within three minutes indicates that the pilot is in need of help. Any pilot who observes such a situation is obliged to render assistance and contact the organisation as soon as possible. A competitor landing to help an injured pilot shall not, at the discretion of the Director, be disadvantaged by this action.

The above procedure is evidently not applicable when the wing is being laid out for take-off, but pilots should beware not to leave the equipment laid out ready and then wait for long periods before taking off.

1.9 ELECTRONIC EQUIPMENT

All pilots shall carry a Flight Recorder which will be issued by the competition organisers. This should be kept switched on and logging throughout flight to enable scoring. Competitors may (and are strongly advised to) carry a backup GPS unit of their own, but if they can be used to aid navigation, these must be sealed before flight and signed off by a marshal.

Competitors are not permitted to use any other navigational aids except in the case of task 2.5 (FAI Triangle), if briefed. Smartphones with Internet or GPS capability may be carried as a back-up but must be checked as switched off and be sealed by marshals before flight. Competitors are advised to carry a 'basic' non-GPS or internet enabled phone, which may be carried unsealed during flight, and this number will be used for notification of task cancellations. This will also enable pilots to telephone marshals for retrieval in the event of landing out without further penalty.

Sealed devices may only be unsealed during a day's flight in order to change batteries. This must be done in the presence of and recorded by marshals at the airfield or at FD points.

1.10 AIRCRAFT AND OTHER EQUIPMENT

Each aircraft shall fly throughout the championships as a single structural entity using the same set of components as used on the first day except that propellers and carburettor jets may be changed. Any further changes to equipment, eg. replacement of parts as a result of damage, must be approved by the director. Such changes will normally be permitted, but will be subject to a default penalty of 20% applied to any subsequent tasks flown, in which the replacement equipment is deemed by the director to offer any potential advantage to the pilot. For tasks in which no advantage can be gained by the use of the replaced equipment, this penalty may be waived, again at the director's discretion.

Aircraft must be flown with manufacturer standard fuel systems only. No pilot modifications to fuel systems such as additional tanks are permitted, except for standard maintenance replacement of fuel pipes, bulbs, and filters. Small header tanks or "comp bottles" may be used provided that they conform to the following limitations:

- Approved by the manufacturer of the aircraft, as evidenced by availability for sale to all pilots through the manufacturer's public website.
- Maximum 1.5 litre volume bottle, as a single structural entity
- If an electric pump is used, it must be certified for use specifically with gasoline.
- Flow metering devices are allowed but must also must be certified for use specifically with gasoline.

It is the responsibility of the pilot to provide evidence of this to the championship organisers, and gain approval, in advance of arrival at the site. There is no need to carry additional or extended fuel tanks in this format because pilots may land to refuel as many times as they need to.

A protective helmet must be worn whenever the pilot is strapped into the harness of an aircraft. Paramotor engines may only be started on the back of the pilot (i.e. not resting on the ground), and when the pilot is wearing a helmet.

An emergency parachute system is mandatory. It is the pilot's responsibility to ensure that this is in a safe and serviceable condition.

All pilots' equipment may be subject to inspection by marshals at any time during the competition and the pilot may be prevented from flying if deemed to be unsafe.

1.11 ASSISTANCE TO PILOTS

Any assistance to pilots on the ground is encouraged, although if Airside, this must be from BHPA members only for insurance reasons. No assistance may be given to pilots in-flight, or in any way regarding their navigation. Anyone other than registered competition pilots must wear hi-vis when airside.

As described in 1.8, any pilot observing that another pilot has landed and has not folded their canopy within three minutes is obliged to render assistance. The Director will decide on appropriate measures after the event to ensure that this does not disadvantage the pilot giving assistance.

1.12 TASK SUSPENSION OR CANCELLATION

The Director may suspend flying after take-offs have started, if to continue is dangerous. Anemometers will be placed on the deck, and take-offs will be temporarily suspended if the windspeed exceeds 7m/s. At any time, the Director may decide to cancel the task, for sporting or safety reasons.

As weather across the whole competition area may vary significantly, it will be pilots' sole responsibility to make appropriate decisions whether and where to take off or not, where and when to fly and land and to take care of their safety.

A task cancellation system will be used only in extreme cases by decision of Competition Director. In the event of task cancellation, an SMS message with the word "CANCEL" will be broadcast to all competitors. Competition and all scoring will stop at the time the text message is sent, and scores for the day will be calculated up to that time.

If flying is cancelled by the director, competitors will retain any points they have scored for the day up to the time of cancellation.

1.13 CHAMPIONSHIP VALIDITY

The Championships will be considered valid if a minimum of the equivalent of five hours' task flying throughout the period of the championship is available and open to competitors.

1.14 SCORING

1.14.1 GENERAL

The overall results will be computed from the sum of the task scores for each competitor, the winner having the highest total score in the class. (S10 4.34.10)

A score given to a competitor shall be expressed to the nearest whole number, 0.5 being rounded up. (S10 4.34.13)

All distances not obtained from GNSS shall be calculated from the official map and rounded up to the next 0.5 km. (S10 4.34.14)

Deduction of penalty points shall be made after scoring for that task is completed. (S10 4.34.16)

If a pilot's score is for any reason negative including penalties his score for the task shall be taken as zero. Negative scores shall not be carried forward. (S10 4.34.18)

The following standard symbols will be used for scoring:

V = Speed, D = Distance, T = Time

Score sheets shall state the date for the task and the date and the time when the score sheet was issued, the task number, classes involved, competitors name, country, competition number and score.

Each valid class shall be scored on a separate score sheet.

Score sheets shall be marked Interim, Provisional, and Official, or if a protest is involved, Final. A Provisional score sheet shall only become Official after all complaints have been answered by the Director. Scores shall not be altered when the Provisional sheet is made Official. (S10 4.34.3)

When interim score sheets are published, a pilot who has not yet attempted a navigation task will be marked as DNFY or "Did Not Fly Yet". This signifies that they may still attempt that task on one of the subsequent days of the championship.

When provisional score sheets are published, it indicates that a task is closed and will not be available again during the championship. This will activate the final deadline for complaints about that task. A pilot who did not fly, scores zero and will be marked DNF or "Did Not Fly" on the score sheet. A pilot who is disqualified scores zero and will be marked DSQ or "Disqualified".

Due to the nature of endurance championships, by which precision navigation tasks are widely spread across a large map area, it is pilot choice which of the navigation task options they choose to attempt. Not all pilots will attempt all tasks, so the rule S.10 4.34.18 does not apply.

If a failure in GNSS flight analysis or scoring is discovered before the end of the championship and the failure is due to a technical error which emanates from the equipment being used for the GNSS flight analysis or scoring, this failure must be corrected regardless of time limits for complaints and protests. (S10 4.34.19)

1.14.2 PENALTIES

In general, any infringement of any flying, safety or task regulations will result in penalty.

Minimum height for the competition as defined by the director will apply at all times when outside of the defined start and finish lines near to the airfield. A 20% penalty will be applied to the total score for that flight, for each incursion below minimum height that lasts longer than 5 seconds in sequence. If the period of time below minimum height is longer than 5 minutes, the penalty is increased to 50%.

The law of the United Kingdom as defined by the Air Navigation Order applies to all pilots.

Actions which will normally result in disqualification:

- a. Bringing the event, its organisers, the FAI or the sporting code into disrepute.
- b. The use of banned substances.
- c. Unauthorised interference with an aircraft in a Secure Area.
- d. Flight outside the specified flight envelope of the aircraft or dangerous flying.
- e. Flight or attempted flight with prohibited equipment.
- f. Unauthorised assistance during a task.
- g. Interference with the firmware or software of a CIMA approved GNSS flight recorder

2. Task details

The following navigation tasks descriptors 2.1, 2.2, and 2.3, and 2.4 provide details of the principles by which tasks will be presented on the official competition map. It should be noted that these task formats may be presented in combination with each other in any particular route given. This will be clearly indicated on the map and described in the initial competition briefing.

2.1 PRECISION NAVIGATION OVER A KNOWN CIRCUIT ("SNAKE")

Objective

To fly a prescribed course between two or more turnpoints, without deviating from the width of the corridor defined in the task. Hidden gates will be placed at unknown points along the line.

Special rules

- TPs used to mark the course do not count for scoring the primary navigation task. They have a radius of 250m.

- The corridor for the course is defined by the width of the hidden gates. These are 250m wide and perpendicular to the given track line, such that the limits of the corridor are 125m to the left and right of the given track line
- The number of hidden gates on the track line, and the approximate length of the curve, and the total point score available for the course, will be given in advance.
- The track line must be flown in the direction indicated on the map.
- Backtracking within the width of the corridor, or flying the course in the wrong direction, results in 0 score for this particular precision course/task. This is for obvious safety reasons.

Scoring

Each hidden gate crossed scores 50 points. A gate crossed twice will be invalidated.

Spatial precision:

$V_h = 50$ (Value assigned to crossing a hidden gate on the track)

N_h = Number of hidden gates correctly crossed (crossed once, in order and proper direction)

Pilot Score $Q = V_h * N_h$

The maximum number of points available for any specific instance of this task will be displayed on the competition map.

2.2 PRECISION NAVIGATION WITH ESTIMATED SPEED

Objective

To fly a prescribed course between two or more turnpoints, having declared estimated times of arrival at each turnpoint, in seconds from the start point of the track. Hidden navigation gates will be placed at unknown points along the line.

Special rules

- TPs used to mark the start and end of each leg do not count for scoring the overlaid pure navigation task 2.4 (if running concurrently). They have a radius of 250m.
- The corridor for the course is defined by the width of the hidden gates. These are 250m wide and perpendicular to the given track line, such that the limits of the corridor are 125m to the left and right of the given track line
- The track line must be flown in the direction indicated on the map.
- Backtracking within the width of the corridor, or flying the course in the wrong direction, results in a zero score for this particular precision course/task. This is for obvious safety reasons.
- Pilots intending to participate in this task must submit their declaration sheet to marshals (or through online system if used) before their first take-off from the airfield within any one task window.
- If a pilot submits a declaration sheet but subsequently chooses not to fly the task, there is no penalty. They may resubmit the declaration sheet with different values again before their next flight if they intend to fly it. After a pilot completes the task, scoring will be made to the most recently time stamped submission of the declaration sheet.

Scoring

Spatial precision

Each hidden navigation gate crossed scores 25 points. A gate crossed twice or crossed in the opposite direction will be invalidated.

$V_h = 25$ (Value assigned to crossing a hidden gate on the track)

N_h = Number of hidden gates correctly crossed (crossed once, in order and proper direction)

$Q_h = V_h * N_h$

Time precision

Crossing time of each timing point will be checked against the pilot declaration. Each second of error will score two negative points. If a point is crossed twice, the pilot will score E_{max} for that point.

Nt = Number of timing points.

Emax = 100 (Maximum error (in seconds) in each timing point).

(i.e. if a pilot arrives more than 100 seconds early or late for the timing point, they will register a maximum error value of 100 and no more for that point.)

Emax seconds error is applied if point not flown.

$Q_{max} = Nt * E_{max}$ (this is the maximum number of time precision points available for a perfect score on the task, and will be displayed on the competition map)

Et = Sum of absolute errors in timing points, in seconds

(i.e. the sum total of all the seconds late or early arrival at all the timing points, limited to a maximum of 100 on each individual point)

$Q_e = Et * 2$ (applies a multiplier of 2 to the error in seconds for scoring)

$Q_t = Q_{max} - Q_e$

$Q_{tmin} = 0$ (Q_t cannot be negative, to ensure that a pilot with high timing errors will still retain their Q_h score)

Pilot score: $Q = Q_h + Q_t$

The maximum number of points available for any specific instance of this task will be displayed on the competition map.

2.3 PRECISION NAVIGATION WITH CONSTANT SPEED

Objective

To fly a prescribed course between two or more turnpoints, maintaining constant ground speed for the duration each leg. Hidden timing gates will be placed at unknown points along the line. The route between turnpoints may be straight or curved legs.

Special rules

- TPs used to mark the start and end of each leg do not count for scoring the pure navigation task 2.4. They have a radius of 250m
- The corridor for the course is defined by the width of the hidden gates. These are 250m wide and perpendicular to the given track line, such that the limits of the corridor are 125m to the left and right of the given track line.
- The track line must be flown in the direction indicated on the map.
- Backtracking within the width of the corridor, or flying the course in the wrong direction, results in a zero score for this particular precision course/task. This is for obvious safety reasons.
- No pre-declaration is necessary for this task. For any given leg of the course, the pilots' expected time of arrival at the timing point will be calculated as a pro-rata percentage of their time taken to complete the leg, equivalent to the percentage distance along the leg that the timing gate is placed.

Scoring

An estimated time for crossing each gate will be calculated by the organization. Crossing time will be checked against this estimation. Each second of error will score one negative point. If a gate is crossed twice, time will be extracted from the first crossing.

Time precision

Nt = Number of time gates.

Emax = 100 (Maximum error (in seconds) in each time gate).

(i.e. if a pilot arrives more than 100 seconds early or late for the timing gate, they will register a maximum error value of 100 and no more for that gate).

Emax seconds error is applied if point not flown.

$Q_{max} = Nt * E_{max}$ (this is the maximum number of points available for a perfect score on the task, and will be displayed on the competition map)

Et = Sum of absolute errors in timing gates, in seconds.

(i.e. the sum total of all the seconds late or early arrival at all the timing gates, limited to a maximum of 100 on each individual gate)

$Q_e = E_t * 2$ (applies a multiplier of 2 to the error in seconds for scoring)

Pilot Score Q = Qmax – Qe

$Q_{min} = 0$ (applies in cases where $Q_e > Q_{max}$ to prevent negative scores)

2.4 PURE NAVIGATION

Objective

To fly a course of the pilot's choice between as many turnpoints or markers as possible within a given maximum time window.

This task is intended to allow pilots to gain bonus points en route to and from the other navigation tasks in this catalogue.

Special rules

- This task runs as a single continuous task throughout the period of the competition.
- Daily task window of available flight time to be specified by the director and briefed. Barring adverse weather conditions, this is normally expected to be between 07:00 and 20:00.
- Daily maximum number of pilot airtime hours to be specified by the Director and briefed. This will not exceed five hours, for safety reasons.
- All turnpoints shown on the maps provided to competitors are valid for this task, unless otherwise briefed. Points that are used to define other precision routes on the task map are not valid for this task.
- According to the briefing, pilots may be required to pass a particular start and finish gate to activate the task.
- This task may be de-activated during other specific tasks in the competition such as economy tasks, according to the briefing.
- Each TP passed correctly in the air for the first time will score its full weighted point value. Subsequent passes of that turnpoint, at any time during the remainder of the competition flying days, will not score any points. But neither will they be penalised if crossed inadvertently whilst transiting towards other tasks.
- Penalty for exceeding maximum defined airtime or task window: 50 points per minute over allowed time.
- Penalty for returning to the airfield by any means other than flight (i.e. outlanding): 50% of the total points scored on that flight up to the point of landing during that flight. For these purposes, a "flight" is considered to be an outward and return journey starting and finishing at the base airfield (i.e. landing at a fuel depot does not start a new "flight"). This penalty is applied to points scored on all navigation tasks (2.1, 2.2, and 2.3 and 2.4) attempted during the same flight

Scoring

Turn point score weightings will vary between 10 and 30 points according to their distance from the Airfield. These will be clearly indicated on the published maps.

Each TP passed correctly in the air for the first time will score its full point value. Subsequent passes of that turnpoint will not score any points, but neither will they be penalised if crossed inadvertently whilst en-route towards other tasks.

If any pilot successfully collects all turnpoints on the competition map during the period of the competition, the board 'resets' and the pilot may continue to score turnpoints for a second time, with all turnpoint values set to 10 points for that pilot from that point onwards.

N_{10} = Number of 10-value turnpoints correctly crossed for the first time by the pilot

N_{20} = Number of 20-value turnpoints correctly crossed for the first time by the pilot

N_{30} = Number of 30-value turnpoints correctly crossed for the first time by the pilot

Pilot score Q = (10 * N_{10}) + (20 * N_{20}) + (30 * N_{30})

2.5 ECONOMY & DISTANCE – CLOSED CIRCUIT WITH 3 LEGS

Objective

To take off from the deck with a limited amount of fuel by weight and fly a triangular course of pilot's choice, maximising distance covered, and returning to land within the airfield. If possible, this task will be set to specifically emulate an FAI record category and it may be possible for pilots to set world records if conditions allow.

Special rules

- All three legs of the chosen triangle must conform to the FAI definition of a closed circuit with 3 legs: to be between 28% and 38% of the total length.
- The length of a closed circuit shall be measured as the sum of the geodesics joining the start point with the finish point, via the turnpoints in the order flown by the aircraft. (S10 3.8.5)
- A turn point is reached when the FR trace is observed to pass through a quadrant (90° degree sector) on the ground with its apex at the turn point and orientated symmetrically to and remote from the two legs of the course which meet at the turn point. (S10 3.8.7)
- Pilots must land within 800m of their takeoff point (i.e. inside the airfield, or crossing a start/finish line as briefed) to validate the closure of the triangle
- Pilots will have fuel measured by weight before take-off.
- Fuel tanks will be sealed by marshals before take-off, and checked again on landing.
- Normally precision landing tasks (2.6 and 2.7) will not be included when this task is set to avoid the risk of pilots burning fuel whilst stacking for a landing approach.
- When this task is set, all other navigation tasks (i.e. 2.1, 2.2, 2.3 and 2.4) are deactivated for the period of this task.
- According to the briefing, pilots may be required to pass a particular start and finish gate to activate the task.
- This is the only task for which pilots may, if it is defined in the briefing, be allowed to carry GPS navigational aids. This is to enable, if conditions allow, longer distances to be covered that take pilots beyond the limits of the standard competition map.

Scoring

$$\text{Pilot score } Q = N \times \frac{D_p}{D_{max}}$$

Where:

N = A multiplier to be defined at the briefing. The maximum score for the task will vary between 1000 and 2000 points, and will be set by the director based on the balance of points available from other task types according to the amount of flying enabled by weather. This value will be announced in the briefing before the task.

D_p = The pilot's distance calculated by the straight line distance between the centres of the three turnpoints used

D_{max} = The maximum distance covered by any pilot in the class

The outcome of the calculation will be rounded to the nearest whole number.

Penalty for exceeding maximum defined airtime or task window: 50 points per minute over allowed time.

Penalty for breaking the seal on fuel tanks outside of marshal supervision: 100%

Penalty for returning to the airfield by any means other than flight (i.e. outlanding): 75% of the points scored up to the point of landing during this task only.

Penalty for completing a 'flat triangle' (i.e. one that is closed by returning to airfield but does not meet the FAI triangle requirements for all legs to be between 28% and 38% of total length): 50% applied to D_p value.

Penalty for not completing a closed triangle (i.e. straight line distance): 75% applied to the D_p value.

2.6 PURE ECONOMY

Objective

Take off with a measured quantity of fuel and remain airborne for as long as possible before returning to the landing deck.

Special rules

- Pilots will fly with limited fuel, measured by weight before take-off.
- Fuel tanks will be sealed by marshals before take-off, and checked again on landing.
- Normally precision landing tasks (2.6 and 2.7) will not be included when this task is set to avoid the risk of pilots burning fuel whilst stacking for a landing approach.
- When this task is set, all other navigation tasks (i.e. 2.1, 2.2, 2.3 and 2.4) are deactivated for the period of this task.
- According to the briefing, pilots may be required to pass a particular start and finish gate to activate the task.

Scoring

$$\text{Pilot score } Q = N \times \frac{T_p}{T_{max}}$$

Where:

N = A multiplier to be defined at the briefing. The maximum score for the task will vary between 1000 and 2000 points, and will be set by the director based on the balance of points available from other task types according to the amount of flying enabled by weather. This value will be announced in the briefing before the task.

T_p = The pilot's time, after penalties for landing out are applied (if applicable).

T_{max} = The longest airtime of any pilot in the task, after time penalties for landing out are applied (if applicable).

The outcome of the calculation will be rounded to the nearest whole number.

Penalty for exceeding maximum defined airtime or task window: no specific penalty, but all pilot times T_p are only counted up to the defined limit.

Penalty for breaking the seal on fuel tanks outside of marshal supervision: 100%

Penalty for returning to the airfield by any means other than flight (i.e. outlanding): 75% of the points scored up to the point of landing during this task only.

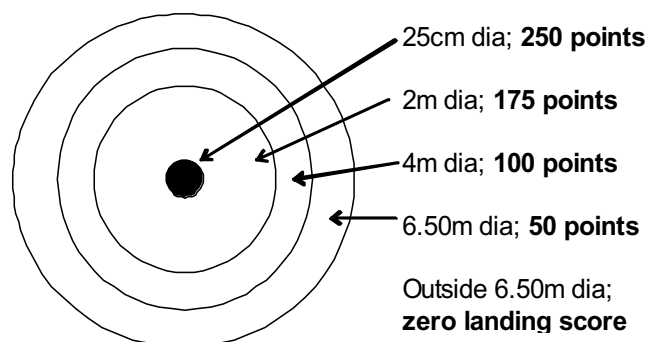
2.7 SPOT LANDING

Objective

To land with engine off as near as possible to a target.

Description

This task will be located at the airfield or at one or more of the FD fuel depot points, as briefed. The location will be briefed in advance.



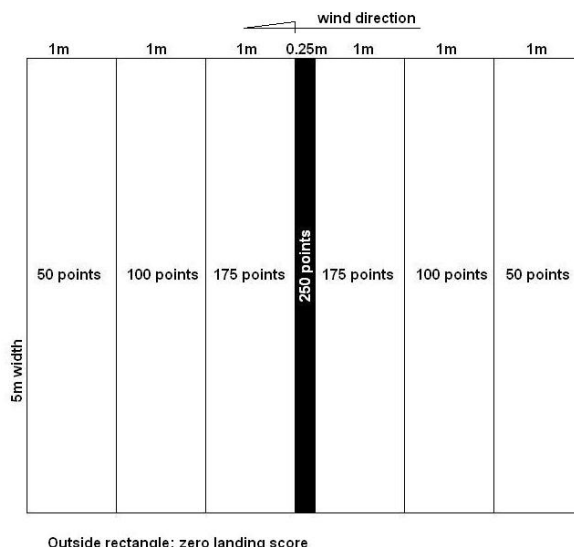
On approach, the pilot should circle the field at minimum 500ft (150m) to indicate to marshals that they are intending to attempt the task. If there are other pilots ahead of them in the queue, they should stack in a circuit above them, over a designated field to the side of the target. Circuit locations will be briefed in advance.

When given a green flag by marshals, they should pass at least 500ft directly overhead the target, cut the engine and try to make a first touch as near as possible to the centre of a target consisting of:

- A series of concentric circles for PF1 class.
- A series of 5m wide parallel strips for PL1 class

Special rules

- A pilot may only attempt each available landing task once per day of flying. They may still land normally in FD points for fuel or rest breaks.
- 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.
- For PF classes, there will be no penalty applied for any part of the aircraft touching the ground prior to the first scoring touch of the foot or wheels, so long as a 'good' landing is achieved, as described in S.10 A3, 3.3.5.
- If a pilot runs out of fuel whilst in a queue for the task, they will be permitted to refuel and attempt the task again.



Penalties

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

Flying less than 45 seconds with no engine: zero landing score.

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

Scoring

Bullseye: 250 points

Inner ring: 175 points

Second ring: 100 points

Outer ring: 50 points

2.8 BOWLING LANDING

Objective

Land with the engine off, hitting as many pins as possible.

Description

This task may be located at the airfield, or at one or more of the FD fuel depot points, as briefed. The location will be briefed in advance.

Five or more 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. Pins will be simply standing on the ground. A pin is said to be hit when it is knocked down.

On approach, the pilot should circle the field at minimum 500ft to indicate to marshals that they are intending to attempt the task. If there are other pilots ahead of them in the queue, they should stack above them, over a field to the side of the target. Circuit locations will be briefed in advance.

When given a green flag by marshals, they should pass at least 500ft directly overhead the target, and cut the engine.

They will fly a minimum of 45 seconds and will try to hit as many pins as possible before touching the ground. Each pin knocked down before touching the ground is scored as a successful hit.

Wind
↓



Landing pins

Special rules

- A pilot may only attempt each available landing task once per day of flying. They may still land normally in FD points for fuel or rest breaks.
- 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.
- For PF classes, there will be no penalty applied for any part of the aircraft touching the ground prior to the first scoring touch of the foot or wheels, so long as a 'good' landing is achieved, as described in S.10 A3, 3.3.5.
- If a pilot runs out of fuel whilst in a queue for the task, they will be permitted to refuel and attempt the task again.

Scoring

Each pin hit successfully is worth 50 points.

Penalties

Not overflying the target or crossing it with engine on: zero landing score.

Flying less than 45 seconds with no engine: zero landing score.

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

2.9 PRECISION WING CONTROL (PF classes only)

Objective

Land and display precise control of the wing before taking off again.

Description

This task will normally be flown in wind conditions in which a reverse launch is possible. A straight course consisting of two sticks is laid out facing approximately into wind. The precise distance between the sticks is arbitrary but they should be a minimum of 100m apart. The pilot enters the course into wind. They must kick the first stick to start their time. They must then land in between the two sticks, bringing the wing down such that the trailing edge is clearly seen to touch the ground.

When a marshal has confirmed that wing has touched the ground they will show a green flag as a signal that the pilot may take off again.

The pilot will then launch and kick the second stick to stop the timer.

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.

- The clock starts the moment the pilot kicks the first stick and stops the moment he kicks the second stick.

- The pilot may have three attempts at kicking each stick.

- If the pilot relaunches the wing before being shown a green flag by the marshal they will incur 100% penalty for the task.

- If a launch fails, the pilot may make as many attempts as they need to relaunch the wing within the specified time limit.

- The maximum time allowed for a pilot to complete the course is 3 minutes.

Scoring

$$\text{Pilot score } Q = N \times \frac{T_{min}}{T_p}$$

Where:

N = A multiplier to be defined at the briefing. The maximum score for the task will vary between 500 and 1000 points, and will be set by the director based on the balance of points available from other task types according to the amount of flying enabled by weather. This value will be announced in the briefing before the task.

T_p = The pilot's recorded time,

T_{min} = The shortest pilot time taken to complete the task

The outcome of the calculation will be rounded to the nearest whole number.

2.10 PRECISION WING CONTROL – GROUND HANDLING (PF classes only)

Objective

Land and display precise control of the wing before taking off again.

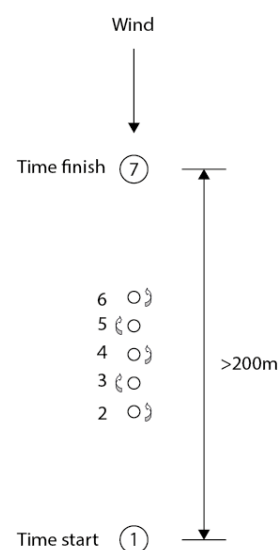
Description

A straight course consisting of two sticks is laid out facing approximately into wind. The precise distance between the sticks is arbitrary but they should be a minimum of 200m apart.

At the centre point between the sticks a minimum of five pins are placed in line with the sticks. The pins are small plastic cones of the type used in sports training. The task director will specify the distance between each pin at the briefing

The pilot enters the course into wind. They must kick the first stick to start their time. They must then land before the first pin, keeping the wing flying in the air above them.

While kiting the wing, they should walk or run through the course of pins, turning in alternate directions around each one to follow a slalom course. The body of the pilot must be clearly observed to pass outside of the line of pins when making each turn, and they must not touch any of the pins. After the pilots has passed the final pin, they will then launch as quickly as possible and kick the second stick to stop the timer.



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. - The clock starts the moment the pilot kicks the first stick and stops the moment he kicks the second stick.

- The pilot may have three attempts at kicking each stick.
- The pilot may turn either to the left or to the right when rounding the first of the pins, so long as they alternate the turn direction on each subsequent pin. - If the wing drops to the ground whilst the pilot is running through the slalom course they may relaunch it as many times as they need within the specified time limit.
- The maximum time allowed for a pilot to complete the course is 3 minutes
- Each pin that is touched by the body of the pilot in the course counts as a missed target.
- Each time the pilot fails to turn outside the line of pins it counts as a missed target.

Scoring

$$\text{Pilot score } Q = N \times \frac{T_{min}}{T_{pen}}$$

Where:

N = A multiplier to be defined at the briefing. The maximum score will vary between 500 and 1000 points, and will be set by the director based on the balance of points available from other task types according to the amount of flying enabled by weather. This value will be announced in the briefing before the task.

Tmin = The shortest pilot time taken to complete the task (after penalties for missed targets)

Tp = The pilots recorded time in the course

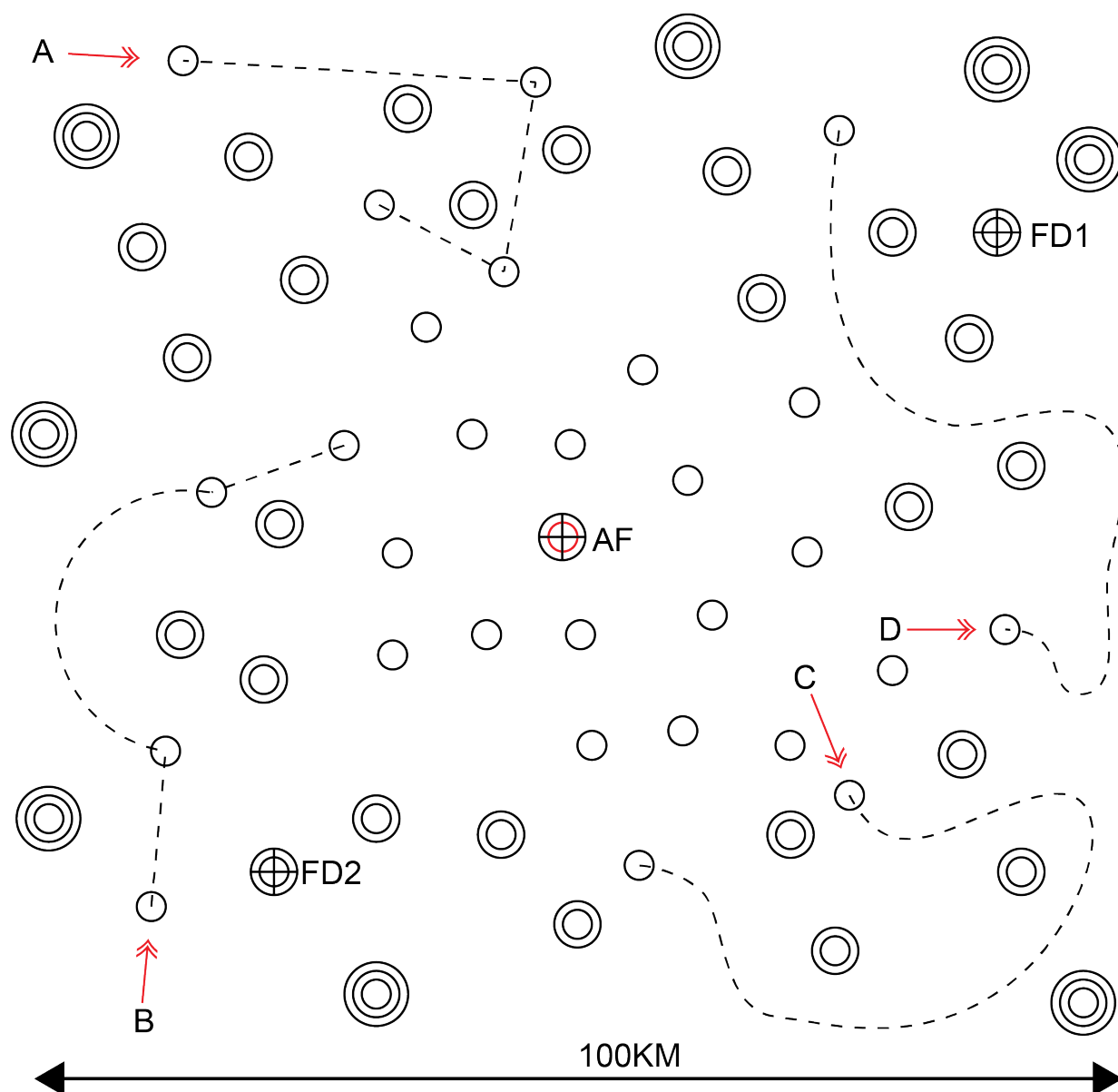
M = the number of missed targets

Vpen = the time penalty for each missed target (seconds)

Tpen = The pilots time (after penalties for missed targets) = Tp + M * Vpen

The outcome of the calculation will be rounded to the nearest whole number.

3. Example Competition Maps and Information for Pilots



FEATURE	NOTES	POINTS VALUE
	TP – Standard Turnpoint	No. of rings indicates value of points for first crossing in the air. i.e. One ring = 10 point, Two rings = 20 points, Three rings = 30 points No points scored for each second crossing of the same point during the competitions (no penalty either)
	FD – Fuel Depot	20 points for first landing 10 points for each further landing
	AF - Airfield	No points for flying through or performing normal landing. Pilots must conclude each competition day by flying back to Airfield to complete the day's task or accept 50% penalty on all points accrued during that flight.
	Route A. Task 2.2 Precision Navigation with Estimated speed	$N_h = 5$: This route contains a total of 5 hidden navigation gates spread over the course, and 3 timing declaration points. $V_h = 25$: Value assigned to crossing each navigation gate $Q_h = V_h * N_h = 125$ (if pilot successfully crosses all hidden navigation gates). $N_t = 3$ = Number of timing gates – one on each turnpoint on the course

		Emax = 100 = maximum error allowed on each timing gate (in seconds) Qmax = 300 = Maximum number of time precision points available for a perfect score on the task, and will be displayed on the competition map Et = sum of absolute pilot error on each timing gate. EG: Gate 1: pilot arrives 10 seconds late. Et1 = 10 Gate 2: pilot arrives 30 seconds early. Et2 = 30 Gate 3: pilot arrives 4 seconds late. Et3 = 4 Et = 54 Qe = Et * 2 = 108 Qt = (Qmax – Qe) = (300 – 108) = 192 Total Q = Qh + Qt = 125 + 192 = 317 points Route may only be flown once in the competition per pilot
B → - - -	Route B. Task 2.3 Precision Navigation with constant speed	Nt = 5 = Number of hidden timing gates spaced along the course Emax = 100 = maximum error allowed on each timing gate (in seconds) Qmax = 500 (Maximum number of time precision points available for a perfect score on the task, and will be displayed on the competition map) Et = sum of absolute pilot error on each timing gate. EG: Gate 1: pilot arrives 10 seconds late. Et1 = 10 Gate 2: pilot arrives 20 seconds early. Et2 = 20 Gate 3: pilot arrives 5 seconds late. Et3 = 5 Gate 4: pilot arrives 25 seconds late. Et4 = 25 Gate 5: pilot arrives 45 seconds late. Et5 = 45 Et = 105 Qe = Et * 2 = 210 Total Q = (Qmax – Qe) = 500 – 210 = 390 points Route may only be flown once in the competition per pilot
C → - - -	Route C. Task 2.2 Precision Navigation	10 hidden gate points distributed throughout this example course. Maximum points available for this route: 500 Vh = 50 (Value assigned to crossing a hidden gate on the track) Nh = Number of hidden gates correctly crossed (crossed once, in order and proper direction) If a pilot crosses 8 of the 10 hidden gates successfully: Nh = 8 Qh = Vh * Nh = 50 * 8 = 400 points Route may only be flown once in the competition per pilot
D → - - -	Route D. Task 2.2 Precision Navigation	20 hidden gate points distributed throughout this example course. Maximum points available for this route: 1000 Vh = 50 (Value assigned to crossing a hidden gate on the track) Nh = Number of hidden gates correctly crossed (crossed once, in order and proper direction) If a pilot crosses 18 of the 20 hidden gates successfully: Nh = 18 Qh = Vh * Nh = 50 * 18 = 900 points Route may only be flown once in the competition per pilot

3.1 MAP AREA EXAMPLE WITH DOWNWIND OUTLANDING

An external outlanding with a downwind precision navigation may be defined in the event of strong wind conditions.

