# TASK CATALOGUE FOR THE WORLD MICROLIGHT CUP 2012 VILLAMARTÍN, SPAIN

## Contents

# 1 Introduction

This catalogue describes tasks which may be set during the Villamartín Microlight World Cup 2011.

## 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, created for the 13th World Microlight Championships 2012 will be tested during the Villamartín Microlight World Cup 2011. It contains a reduced set of well known tasks that have been tested in at least one previous FAI Cat I event.

In order to simplify everyone's work without sacrificing task quality, a number of design decisions have been taken.

- Ground pictures or markers will never be used for scoring. However, they will 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 most 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.
- Homogeneous scoring criteria have been applied across tasks. This allows for better understanding by pilots and simplifies the job of implementing an automated 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.

## 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.

## 1.3 General rules

Rules common to several tasks have been extracted into this section. Individual task descriptions contain links to the applicable rules in this section.

### 1.3.1 Fuelling rules for fuel-limited tasks

#### Fuelling procedure

A specified weight of fuel will be allowed in each class. Fuel weighing will be done in the presence of a marshal. Each pilot will choose between weighing the exact amount of fuel or increasing it by an arbitrary safety amount. In the second case, a second weighing shall be performed after landing.

Marshals or opponent team members will check the fuelling of aircraft. Before fuelling an aircraft it's tanks and fuel lines must be reasonably empty. After fuelling a marshal will seal the tanks and other parts of the fuel system at his or her discretion.

#### Fuel checking after landing

Fuel checking will be done in quarantine after the flight. After landing, pilots will be directed to the quarantine area and a marshal will check the integrity of the fuel seals.

If the pilot flew with a safety amount of fuel, the remaining fuel will be measured and the difference will be calculated.

Then, the marshal will allow the pilot to leave the area.

### 1.3.2 Planning rules

#### Last-minute task details

When planning has to be done individually, certain task details, like turn-points or ground features will not be given during the briefing. Instead, pilots will receive such information just before they are allowed to start planning their flight.

#### Planning in quarantine

Planning will be performed in quarantine. Pilots will receive last minute task details and they will start their planning individually.

No communication devices or electronic devices capable of performing calculations will be allowed. The only exceptions are non-programmable electronic calculators.

#### Planning in timed quarantine

In addition to the rules for planning in quarantine, planning time (PT) will be taken when the pilot receives last minute task details.

The director may designate a planning time for each pilot. In this case, marshals will hand last minute task details at the designated pilot's time.

### 1.3.3 Take-off rules

#### Take-off at a designated time

Take-off time will be designated for each pilot and published in advance. Pilots will be penalised for not being ready for take-off in time.

Marshalls will allow one minute for take-off since the pilot is in position.

#### Take-off after planning

This procedure applies when planning time is included int the overall task time, so pilots will be willing to take-off as soon as possible.

The take-off order will be determined by the order in which the declarations were handed to the marshal.

Aircraft will line up in a take-off queue and wait for the preceding pilots to take-off. Marshals will speed up the operation and any pilot causing a delay will be sent to the last position in the take-off queue.

#### Time from take-off to start point

A maximum time from the effective take-off to crossing the start point (SP) will be established in navigation tasks. Pilots will be penalised for a delayed crossing of SP.

#### Take-off in open window

The opening and closing for the take-off window times will be published in advance.

A pilot may decide to take-off at any moment. This will be indicated by joining the take-off queue while the window is open. No pilot will be allowed to join the take-off queue after the take-off window is closed.

Once in the take-off queue, the pilot will wait for the preceding pilots to take off. A pilot who causes a delay of more than 30 seconds in the take-off queue will be sent out of the take-off queue. He will be able to join the queue again if the window continues open.

### 1.3.4 Flight recording rules

The use of a CIMA approved flight recorder (logger) is mandatory during every navigation or economy task.

After landing and securing their aircraft, pilots will proceed to the track download office.

### 1.3.5 Sealed phone rules

A pilot who needs to carry a phone during a task may do so by sealing it.

The procedure for sealing and seal checking is described in the sealed device sheet on page 5.

### 1.3.6 Scoring rules

Calculations will be performed using full numerical precision.

Rounding will only be done when calculating Q and P values (see scoring formulas in each task sheet) and will be done to the nearest integer value.

Q and P variables will always be integers greater than or equal to zero. If a calculation results in a negative number, zero will be assigned as the result.

### 1.3.7 General penalties

#### 20% of the overall task score for

- Not being positioned at the deck at the designated take-off time
- Not taking off within the deck limits when a standard deck take-off is required
- Crossing the start point after the designated crossing time
- Landing out of the designated deck when a standard deck landing is required
- Failing to follow the marshal's indications

#### 100% of the overall task score for

- Breaking the quarantine
- Flying into a no-fly zone
- Fuel seal broken
- Consuming more fuel than the designated amount
- Landing out of the briefed airfield boundaries
- Not following the sealed device procedure

### 1.3.8 Sealed phone sheet

#### Instructions

Pilots will fill in one of this sheets if they want to carry a sealed phone during a task. It's the pilot's responsibility to have the necessary sheets at the moment of sealing.

Each competitor may use his own wrapping method, or the marshals may provide it. In any case, a marshal will decide if the method is valid, verify that the phone is disconnected and proceed to seal the device and verify that it can't be connected. The marshals will keep this sheet while the device is sealed.

Marshals may inspect the competitors' integrity of seals at any time during a task.

After the task, pilots will request their seals to be inspected and checked against the sealing records. This sheet will be given back to the pilot if the seal is not broken.

At the end of the scoring process of each task, the scoring team will review the pending sheets. Pilots who haven't got their sheets back will get a 100% penalty in the task.

**Pilot** _____

**Device** _____

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

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

**Pilot's Signature**

**Marshal** _____

**Marshal's Signature**:

# 2 Navigation Tasks

## 2.1 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.

### 2.1.1 Precision Navigation – Declaration Sheet

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

**Pilot** _____

**Device** _____

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

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

**Pilot's Signature**

**Marshal** _____

**Marshal's Signature:**

## 2.2 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 = (Qg + 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.

### 2.2.1 Curve Navigation – Declaration Sheet

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

**Pilot** _____

**Device** _____

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

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

**Pilot's Signature**

**Marshal** _____

**Marshal's Signature:**

## 2.3 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 but no declaration is needed in this task.

### 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.

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

#### 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 * (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.

# 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 briefed airfield boundaries.

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 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

## 3.3 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

| | | |
|---|---|---|
| T | = | Time from SP/FP to the first track intersection |
| Tmin | = | Shortest time in the class |
| Qt | = | 300 * Tmin / T |

Total

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

### Task-specific penalties

None

## 3.4 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 Deck Take-off

Take off from a deck 100 metres long by 25 metres wide.

This task proves the short take-off capability that is fundamental to the performance characteristics of a Microlight by demonstrating that the aircraft can take off in 100 metres in still air at sea level. Where local conditions, such as airfield altitude or slope of the runway, will make a significant difference to take-off runs the length of the deck may be adjusted accordingly.

### Take-off

This task will form the start of another task. The take-off order will be specified at the main task briefing. The pilot must position his aircraft with its main wheels, or tail wheel in the case of a tail-dragger, immediately in front of the start line of the deck to the satisfaction of the marshal and must not take off until instructed to do so by the marshal. The form of signal to be used by the marshal for this purpose will be specified at the briefing.

### Procedure after Take-off

The procedure to be flown after take-off will be specified in the main task at the briefing.

### Scoring

There is no score for a deck take-off but instead a 20% penalty will normally be applied to the main task if the aircraft fails to leave the ground before reaching the end of the deck. This penalty will normally apply if the aircraft:

- Commences take-off before stationary
- Commences take-off before instructed to do so by the marshal
- Main wheels fail to leave the ground before reaching the end of the deck.
- Touches the ground before climbing away.

## 4.2 Deck Landing

Land in a deck 100 metres long by 25 metres wide.

This task proves the short landing capability that is fundamental to the performance characteristics of a Microlight by demonstrating that the aircraft can land in 100 metres in still air at sea level. Where local conditions, such as airfield altitude or slope of the runway, will make a significant difference to landing runs the length of the deck may be adjusted accordingly.

### Joining

This task will form the end of a task. Instructions for joining will be provided at the briefing or in the instructions for the prior task.

### Landing

Once the aircraft has started its final approach no deviation of over 90º from the deck centreline either in the air or on the ground is permitted. The pilot may choose whatever engine setting he chooses or may switch off the engine unless otherwise instructed at the briefing. The aircraft must come to a complete standstill and must not move until instructed to do so by a marshal.

### Scoring

There is no score for a deck landing but instead a 20% penalty will normally be applied to the main task if the aircraft fails to touch down and come to a halt within the deck. This penalty will normally apply if:

- Any part of the aircraft touches the ground before the deck.
- The aircraft turns by more than 90 degrees from the deck centreline between starting the landing approach and coming to a standstill.
- The aircraft does not stop within the limits of the deck.
- The aircraft moves from the deck before instructed to do so by a marshal.
- The aircraft is unable to taxi or take off unaided following the touchdown although failure to start the engine will not incur a penalty.

## 4.3 Precision Landing

Touch down within a marked deck as close to the start of the deck as possible, optionally at a specific time and coming to a halt in as short a distance as possible.

This task simulates a landing on an aircraft carrier deck, the deck being a deck 100 metres long and 25 metres wide. The first 25-metre section of the deck is divided into five 5 metre strips which are scored from 250 to 50 points as shown. The remainder of the deck scores 25 points. In order to score the main wheels must touch down in a particular strip and the aircraft must come to a complete halt within the 100-metre deck, as close to the start of the deck as possible.

### Take-off

Pilots will perform a standard deck take-off from their designated deck.

### Climbing circuit

The procedure for the climbing circuit will be specified at the task briefing.

### Engine to stop or idle

The aircraft must approach the deck in the landing direction at a height of 1,000 ft. Before passing over the start of the deck the engine must be switched off or the throttle must be closed and the engine set to idle, as specified in the briefing. The aircraft must then fly over the full length of the deck before starting the descending circuit.

### Descending Circuit

The procedure for the descending circuit will be specified at the briefing.

### Landing

Once the aircraft has started its final approach no deviation of over 90º from the deck centreline either in the air or on the ground is permitted and the engine must remain at idle or may be switched off. The aircraft must come to a complete standstill and must not move until instructed to do so by a marshal.

### Scoring

Landing score is the value of the strip in which both main wheels touch down. Touching down on a dividing line scores the higher of the two strips.

Ps = Valid strip value

Distance score (**optional**) from the finish of the deck and the closest wheel.

Pd = 1 point per whole metre

Time score (**optional**) calculated from the number of seconds of deviation (T) between the touch down time and a full minute on the official clock outside a margin of ±5 seconds.

Pt = 100 – 5 * T

Total

P = Ps + Pd + Pt

### Task-specific penalties

100% of the total score when

- The aircraft commences take-off before instructed to do so by the marshal
- The engine is not stopped or the throttle is not closed before passing over the deck
- The aircraft does not pass over the entire length of the deck before turning to descend
- The engine does not remain at idle once final approach has started if engine idle permitted
- The aircraft turns by more than 90 degrees from the deck centreline between starting the landing approach and coming to a standstill
- Any part of the aircraft touches the ground before the deck.
- The aircraft does not stop within the limits of the deck.
- The aircraft moves from the deck before instructed to do so by a marshal
- The aircraft is unable to taxi or take off unaided following the touchdown although failure to start the engine will not incur a penalty

## 4.4 Powered Precision Landing

Touch down within a marked deck as close to the start of the deck as possible, optionally at a specific time and coming to a halt in as short a distance as possible.

This task simulates a landing on an aircraft carrier deck, the deck being a deck 100 metres long and 25 metres wide. The first 25-metre section of the deck is divided into five 5 metre strips which are scored from 250 to 50 points as shown. The remainder of the deck scores 25 points. In order to score the main wheels must touch down in a particular strip and the aircraft must come to a complete halt within the 100-metre deck, as close to the start of the deck as possible.

### Joining

This task will follow the completion of a prior task in which no landing is required. Instructions for joining will be provided at the briefing or in the instructions for the prior task.

### Landing

Once the aircraft has started its final approach no deviation of over 90º from the deck centreline either in the air or on the ground is permitted. The pilot may choose whatever engine setting he chooses or may switch off the engine unless otherwise instructed at the briefing. The aircraft must come to a complete standstill and must not move until instructed to do so by a marshal.

### Scoring

Landing score is the value of the strip in which both main wheels touch down. Touching down on a dividing line scores the higher of the two strips.

Ps = Valid strip value

Distance score (**optional**) from the finish of the deck and the closest wheel.

Pd = 1 point per whole metre

Time score (**optional**) calculated from the number of seconds of deviation (T) between the touch down time and a full minute on the official clock outside a margin of ±5 seconds.

Pt = 100 – 5 * T

Total

P = Ps + Pd + Pt

### Task-specific penalties

100% of the total score when

- The aircraft turns by more than 90 degrees from the deck centreline between starting the landing approach and coming to a standstill
- Any part of the aircraft touches the ground before the deck.
- The aircraft does not stop within the limits of the deck.
- The aircraft moves from the deck before instructed to do so by a marshal
- The aircraft is unable to taxi or take off unaided following the touchdown although failure to start the engine will not incur a penalty

## 4.5 Short Take-off over an Obstacle

Take off over and clear an obstacle, starting the take-off run as close to the obstacle as possible.

This task simulates a short field takeoff over a hedge, the hedge being represented by a tape stretched across the runway 1 metre above the ground. The pilot may position his aircraft on the runway as close as he wishes to the tape. This distance will be measured from the centre of the foremost wheel and rounded up to the nearest 0.1 metre. The aircraft must the take off over the tape without breaking it.

### Take-off

The take-off order will be specified at the task briefing.

The pilot may position his aircraft as close to the tape as he wishes and must not take off until instructed to do so by the marshal. The form of signal to be used by the marshal for this purpose will be specified at the briefing.

### Procedure after Take-off

The procedure to be flown after take-off will be specified at the briefing.

### Scoring

Score is based on the distance from the point where the take-off run starts and the tape. Distance will be invalid when

- The aircraft commences takeoff before stationary
- The aircraft commences takeoff before instructed to do so by the marshal
- The aircraft fails to fly over the tape
- Any part of the aircraft breaks the tape

The competitor in each class that starts the take-off run closest to the tape (Dmin) and clears the tape without breaking it will score 250 points. Other competitors will be awarded scores based on their distance from the tape at the start of their take-off run (D) relative to Dmin.

D = Valid distance from the start of the take-off run to the tape
Dmin = Minimum valid distance in the class
P = 250 * Dmin / D

### Task-specific penalties

None

## 4.6 Short Landing over an Obstacle

Fly over and clear an obstacle, to land and come to a standstill as close to the obstacle as possible.

This task simulates a short field landing over a hedge, the hedge being represented by a tape stretched across the runway 1 metre above the ground. The pilot must land over the tape and stop. This distance will be measured from the centre of the foremost wheel and rounded up to the nearest 0.1 metre.

### Joining

This task may form part of another task. Instructions for joining will be provided at the briefing or in the instructions for the main task.

### Landing

Once the aircraft has started its final approach no deviation of over 90º from the centreline of the runway is permitted. The pilot may choose whatever engine setting he chooses or may switch off the engine unless otherwise instructed at the briefing. The aircraft must come to a complete standstill and must not move until instructed to do so by a marshal.

### Scoring

Score is based on the distance from the tape to the point where the aircraft comes to a standstill. Distance will be invalid when

- The aircraft fails to fly over the tape
- Any part of the aircraft touches the ground before the tape
- Any part of the aircraft breaks the tape
- The aircraft turns by more than 90 degrees from the runway centreline between starting the landing approach and coming to a standstill
- The aircraft is unable to taxi or take off unaided following the touchdown although failure to start the engine will not incur a penalty

The competitor in each class that comes to a standstill closest to the tape (Dmin) having cleared the tape without breaking it will score 250 points. Other competitors will be awarded scores based on their distance from the tape when they stop (D) relative to Dmin.

D = Valid distance from the tape to the point where the aircraft stops
Dmin = Minimum valid distance in the class
P = 250 * Dmin / D