3. Task Catalogue

3.1. GENERAL CONDITIONS

3.1.1 EVALUATION OF FLIGHTS:

All tasks with the exception of those on precision landing are scored with the aid of the GNSS recording equipment.The recording devices are set up for recording in 1-second intervals, unless specified otherwise for a particular task. Each competitor is responsible for correctly setting up their recording equipment and for the condition of their batteries. The recording equipment records location in values of co-ordinates and parallels of latitude, altitude above the sea-level and the time of performing each particular recording at preset intervals. The location in which the recording was taken is called a fixed point or "a fix". In the event an error is made or any competitor becomes disadvantaged as a result of incorrect setting or placement of the recording equipment, discharged batteries or a technical failure, the organizers cannot be held responsible for such occurence and competitor may not request an adjustment or change to be made to his results. A competitor may utilize two FR and, in the event of failure or of limited functionality of one FR, the other FR or a combination of both recorders may be used by the organizers. Should the recording not be continuous and it wasn't possible to substantially prove flight continuity and assess the flight with the aid of both recorders, then the flight shall not be evaluated.

3.1.2 THE TIME AND SPEED MEASUREMENT

a) The time is primarily measured by subtracting the time of the appropriate fix point of the FR recording in a defined location – the time gate.

b) The first measured time is the time measured at the start point.

c) The time of the fix point is a time of fix located immediately before the gate.

d) In task sheet may be fixed for legs, where the maximal or minimal speed will be measured and evaluated, that will be measured the nearest fix point before starting gate and first fix point behind the finish gate.

e) Permissible variation of ± 5 seconds is granted while measuring time for check of declared speed at relevant leg. Each flight crew is assigned their take-off time by the take-off list. It is determined by the hour, minute and the second. HH:MM:SS. (for example. 12:05:00). It is each competitor's duty to take off at the predetermined time at the earliest and within the 60 seconds following this predetermined time at the latest. A premature or delayed start shall be penalized, unless specified otherwise at the briefing, at 10 % of the task value.

3.1.3 STARTING LIST

Starting list will be set by declared speed from the highest to the lowest. Purpose is avoiding of collisions during a flight. Team Leaders shall declare speeds of their competitors no later than 2 hours before 1st Tp time. information will be published in the relevant briefing. The starting list will be published as soon as possible, no latterthan 1 hour before 1stTptime.

3.2 GENERIC TASKS

3.2.1 PRECISION NAVIGATION ALONG A KNOWN TRACK

Objective:

To fly as precisely as possible along a known track, whilst identifying ground features from photos provided, or ground markers and marking them accurately on a map. All or a defined part of the course may be scored against declared groundspeed(s). Defined legs of the course may be flown for fast or slow speed. The course may consist of straight legs, circles and/or curves.

A start order will be given. The course will start at SP and each competitor's time will commence at the given SP time. Groundspeed may be measured against elapsed time from SP time as the aircraft passes timing gates, or may be sampled between timing gates. Track accuracy will also be awarded by passing through track accuracy gates. The position of gates will not be given.

Photosheets will be given. If more than one is given then the changeover point along the course where one sheet ends and another starts will be specified. A list of possible ground markers is given in the local regulations. Competitors should identify on a map the actual position of the ground markers and the ground features in the photos. The task ends at FP. The procedure for the flight from takeoff to SP and from FP to landing will be as briefed.

Scoring:

Each track accuracy gate passed correctly = 100 points

Timing gates passed correctly = 100 points – 5 points per second over +/- 5 second tolerance from calculated time.

Each correctly identified ground feature or marker marked within 2 mm on official scoring map = 100 points. If greater than 2mm but less than 5mm = 0 points. If greater than 5mm = -100 points.

Fast / slow – (crews fast speed/fastest speed) x 500 + (slowest speed/crews slow speed) x 500

Competitor's score = Q/Qmax x 1000 where:

Q= Competitor's individual accumulated score

Qmax = best individual accumulated score in task/class

3.2.2 PRECISION NAVIGATION WITH A PARTIALLY KNOWN TRACK

Objective:

To fly as precisely as possible along a known track, and to then construct and fly subsequent legs of the track from information found. All, or defined part of the course may be scored against declared groundspeed(s) – or alternatively may be flown with points for fastest speed. The course may consist of straight legs, circles or curves. There may be additional photos of ground features to spot, or ground markers.

Task starts at SP. First track line will be known. When competitor finds a certain marker or feature this will dictate the turnpoint for the next leg which will be a straight line to the SP of the second known track line. Situation repeats until FP.

If competitor does not find a turnpoint feature/marker, they should continue to the end of the known track line then fly directly to the SP of the next known track line (or FP).

Groundspeed can be sampled anywhere on the course between unknown gates. No gate will be within 2km of a turnpoint – but gates may be either side of a turnpoint (means groundspeed may include travel around the turnpoints). Track accuracy will also be awarded by passing through track accuracy gates. The position of gates will not be given.

Photosheets will be given. If more than one is given then the changeover point along the course will be given where one sheet ends and another starts. A list of possible ground markers is given in the local regulations Crews should identify the actual position of the ground markers, and the ground features in the photos. Task ends at FP. The procedure for the flight from takeoff to SP and from FP to landing will be as briefed.

Scoring:

Each track accuracy gate passed correctly = 100 points.

Timing gates passed correctly = 100 points – 5 points per second over +/- 5 second tolerance from calculated time.

Each correctly identified ground feature or marker marked within 2mm on official scoring map = 100 points. If greater than 2mm but less than 5mm = 0 points. If greater than 5mm = -100 points.

If flown for speed, the speed score = fastest elapsed time/competitor‟s elapsed time x 300

Competitor‟s score = Q/Qmax x 1000 where:

Q= Competitor‟s individual accumulated score

Qmax = best individual accumulated score in task/class

Examples:

- „Gearwheel‟ - Known track consists of two concentric circles. SP is on outer circle. Pilot starts course on time and proceeds around circle in given direction looking for photos and markers and keeping to declared groundspeed. When turnpoint marker/photo is found, a line consisting of a radial is constructed and flown to intersect with the inner circle. Photos and markers may be found on the constructed line and groundspeed continues. On reaching inner circle follow it looking for photos and markers and keeping to declared groundspeed. When turnpoint photo/marker is found, a line consisting of a radial is constructed and flown towards the outer circle. Photos and markers may be found on the constructed line and groundspeed continues. On reaching outer circle continue and repeat process until FP.

- „Zigzag‟ – Known track consists of a number of separated straight lines. Pilots starts course on time and proceeds in given direction looking for photos and markers. When turnpoint photo/marker is found a straight line is constructed to the SP of the second line. Repeat process until FP. If competitor does not find a turnpoint feature/marker, they should continue to the end of the known track line then fly directly to the SP of the next known track line (or FP). Groundspeed may be flown on entire course, or if wind strength is too much competition director may define groundspeed legs and competitors declare groundspeeds for each.

-„Find the right way” – Competitors should take off from the departure deck in T1, in the time T2 pass the Start point gate, follow the drawn track, find the ground features and mark it into the map, construct unknown part of track in accordance with the following instructons, keep the declared speed over the drawn part of the track. The competitor(s) will receive the map and 2 sets of photos.

Task finishes at the final point. Into the task is inserted precision task – 6 m box. Landing after passing the FP will be independent precision task.

T0 = T1 - __ minutes

T2 = T1 + __ minutes

T3 = time of passing the FP +___minutes

CP = TP4.

Instructions for construction the unknown parts of the track and the Task description:

In the competition map will be drawn: SP, TP1, straight line between SP and TP1, arcs r1 and r2 and center S1, TP3Alfa, TP3 Echo, TP3 Foxtrot, TP4, curves between TP3 (A, E, F) and TP 4, position of 6m box, TP5, TP6, curve between TP5 and TP6 and

lines Whiski, Yankee and Zulu and FP. Unknown will be the position of the marker (letter) at the arc r1, the position of TP2 and correct track from TP2 to TP 4 and the position of the marker (letter) situated at the curve between TP5 and TP6, what defines the correct track from the TP6 to the FP. The SP and the TP1 are the the known time gates. In the SP gate will be checked the time T2. In the TP1 gate will be checked correct time calculated from pilot´s declared GND speed and distance SP – TP1. Competitor shall find a marker – (letter or A, or E or F) at the arc r1.

Position of this letter defines:

a) construction point,

b) position of hiden gate

c) letter defines, which TP 3 (A, E, F) is the right one.

Competitors shall draw streight line from S1, through the markers position to r2. The junction of r2 and streight line from S1 defines position of TP2. From TP2 competitor shall draw streight line to the right TP3. In the hidden gate will be checked time calculated from pilot´s declarated speed and distance. If competitor did not find the marker at the arc r1, he shall fly directly to the TP4. Competitor shall follow the track from position of marker to TP2 and to right TP 3 (Only for example TP3F is used, how is displayed in the picture) and TP4. Anywhere between the right TP3 and TP 4 can be situated hidden gates. Checked will be keeping of declarated speed calculated in km/h. No hidden gate will be between the letter position and the right TP3. After passing the TP4 competitor will make touch and go landing into the 6 m box. From 6m box competitor shall fly directly to the TP5. TP5 is the known time gate. After passing TP5 competitor shall follow the curve to the TP6. At the curve is loaded marker – letter or Whiski, or Yenkee or Zulu. Letter defines, which line is the right one track from TP 6 to FP. (Only for example Zulu is used, how is displayed in the picture). Anywhere on the track from TP5 to FP can be some sectors, where will be checked keeping of declarated ground speed (in km/h). If competitor did not find the letter (W, Y, Z), he shall fly directly from TP 6 to FP. True or false photos or markers can be situated on the track, only true photos or markers can be on the track from position of marker at the arc r1 to TP3. After passing FP competitor shall fly directly to the airfield. Landing will be independently scored precision task.

Scoring:

Each track accuracy gate passed correctly = 100 points

Timing gates passed correctly = 100 points – 5 points per second over +/- 5 second tolerance from calculated time.

Each correctly identified ground feature or marker marked within 2 mm on official scoring map = 100 points. If greater than 2mm but less than 5mm = 0 points. If greater than 5mm = -100 points.

Competitor‟s score = Q/Qmax x 1000 where:

Q= Competitor‟s individual accumulated score

Qmax = best individual accumulated score in task/class

3.2.3 CONTRACT TURNPOINT HUNT

Objective:

To visit as many turnpoints as possible in limited time to a declared plan. Crews assemble next to aircraft prepared for flight in quarantine area near takeoff deck. On stated time they receive map with turnpoints and limited time starts. Before takeoff crews must complete a declaration stating which turnpoints and in which order they intend to visit them. This must be handed to the marshall on start of takeoff deck. Marshalls shall allow aircraft departure every 30 seconds in order of aircraft leaving quarantine ready for flight. Any aircraft reaching the deck and not ready to takeoff shall be sent to back of queue.

After takeoff crews shall fly to SP using procedures as briefed. After last turnpoint is visited crews should fly to FP where time finishes. The procedure for the flight from takeoff to SP and from FP to landing will be as briefed.

Scoring:

Each correctly visited turnpoint = 100 points. Each turnpoint declared and not visited = -100 points. If visited in wrong order = -100 points per incorrectly visited turnpoint.

Crews score = Q/Qmax x 1000 where:

Q= Crews individual accumulated score

Qmax = best individual accumulated score in task/class

3.2.4 POWERED PRECISION LANDING

PRECISION LANDING WITH ENGINE OFF

Objectives

The objective is for the aircraft to touch down within a marked deck, as close to the start of the deck as possible, coming to a halt in as short a distance as possible.

This task simulates a landing on an aircraft carrier deck, the deck being 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.

Landing

Once the aircraft has started its final approach no deviation of over 90 ° 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

The score will be the value of the strip in which both main wheels touch down (PS) plus the distance between the finish of the deck and the closest wheel, scored 1 point per whole metre (PD). Touching down on a dividing line scores the higher of the two strips.

The pilot will be scored zero 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

Thus the score calculation will be (PS + PD) x 250/350 with a maximum score of 250

3.2.5 POWERED PRECISION LANDING – TIMED

PRECISION LANDING WITH ENGINE OFF - TIMED

Objectives

The objective is for the aircraft to touch down within a marked deck at a specific time, as close to the start of the deck as possible, 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. Additional points may be

scored if the scoring touchdown takes place at or near an exact full minute as indicated by the competition clock, eg 11:31:00 hrs is a full minute, 11:31 17 hrs is not.

Landing

Once the aircraft has started its final approach no deviation of over 90 ° from the deck centreline either in the airor 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

The score will be the value of the strip in which both main wheels touch down with the ground (PS) plus the distance between the finish of the deck and the closest wheel, scored 1 point per whole metre (PD). Touching down on a dividing line scores the higher of the two strips. If the aircraft touches down on a full minute, the time being taken from the official clock, ± 2-5 seconds a further 100 points is scored (PT). This score will be reduced by 5 points for every second outside ± 2-5 seconds from a full minute.

The pilot will be scored zero 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

Thus the score calculation will be (PS+PD+PT) x 250/450 with a maximum score of 250

3.2.6 SHORT TAKEOFF OVER AN OBSTACLE

Objectives

The objective is for the aircraft to take off over and clear an obstacle, starting the takeoff 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. The takeoff 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. The procedure to be flown after takeoff will be specified at the briefing.

Scoring

The competitor in each class that starts the takeoff 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 takeoff run (DP) relative to DMIN. The competitor will be scored zero if:

- 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

Thus the score calculation will be (250 x DMIN / DP) with a maximum score of 250

3.2.7 SHORT LANDING OVER AN OBSTACLE

Objectives

The objective is for the aircraft to 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.

Once the aircraft has started its final approach no deviation of over 90 ° 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

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 (DP) relative to DMIN. The competitor will be scored zero if:

- 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

Thus the score calculation will be (250 x DMIN / DP) with a maximum score of 250

3.2.8 DECK TAKEOFF

Objectives

The objective is for the aircraft to take off from a deck 100 metres long by 25 metres wide. This task proves the short takeoff 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 takeoff runs the length of the deck may be adjusted accordingly.

This task will form the start of another task. The takeoff 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.The procedure to be flown after takeoff will be specified in the main task at the briefing.

Scoring

There is no score for a deck takeoff 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 takeoff before stationary

- Commences takeoff 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.

3.2.9 DECK LANDING

Objectives

The objective is for the aircraft to 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.

Once the aircraft has started its final approach no deviation of over 90 ° 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

3.2.10 TASKS WITH LIMITED FUEL

AREA TRIANGLE AND SPEED

Objectives

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. A standard fuelling operation will be performed. Each class will have a designated amount of fuel. A single start and finish point (SP/FP) will be given at the briefing. No quarantine planning nor declaration is required. 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. 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 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

3.2.11 DURATION

Objectives

Fly for as long as possible on a limited amount of fuel. A standard fuelling operation will be performed. Each class will have a designated amount of fuel. A start point (SP) and finish point (FP) will be given. No formal planning is necessary for this task. 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. 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 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

3.2.12 TURN-POINT HUNT WITH LIMITED FUEL

Objectives

Fly the maximum number of turn points with a limited amount of fuel and return to the airfield. A standard fuelling operation will be performed. Each class will have a designated amount of fuel. Competitors will be given a list of turn-points. Planning will be done in quarantine but no declaration is needed for this task. 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. Pilots will fly to as many turn-points as they wish trying to maximize both number of turn-points and distance. 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