

1. The competition will start on January 1st and end on December 31st.
2. Any flight that originates in the UK may count towards a pilot's score, including those made whilst competing in any BGA-rated competition.  
Points will only be awarded to the P1 in a two-seater.
3. There are several ladder competitions, as shown below.

**3.1 Primary Ladders:** The winners of the following ladders will qualify for an annual BGA Trophy:

- **Open Ladder** For any cross-country flight.
- **Weekend Ladder** For cross-country flights made on weekends or Bank Holidays.
- **Junior Ladder** For cross-country flights by pilots not yet 26 years of age at the start of the Ladder season.
- **Vintage Ladder** For gliders constructed primarily of wood and/or metal.

**3.2 Secondary Ladders:** No trophies are awarded for the following ladders:

- **Open Height Ladder** For height gain flights.
- **Weekend Height Ladder** For height gain flights made on weekends or Bank Holidays.
- **Distance Ladder** Cumulative distances from all cross-country flights.

**3.3 Racing Ladders:** (See Appendix A)

- **FAI Racing Ladder** Handicapped speed-only flights around FAI 28% triangles.
- **Open Racing Ladder** Handicapped speed-only flights around any task shape.

4. For each competition a pilot may enter any number of flights but only the best six\* will count towards a final placing. No more than one cross-country and one height gain may be claimed from a single flight except that:
  - Full cross-country points may be claimed for each individual completed circuit of a pre-declared multiple lap course.
  - Full cross-country points may be claimed for one or more pre-defined club tasks.

A claim from any single flight may be entered for all ladders for which it qualifies.

\*Any number of flights will count towards the Distance Ladder.

**Note 1:** *The turnpoints for a multiple lap course must be identical, and flown in the declared order, for each lap. It is not necessary to declare in advance how many circuits will be attempted. See also Rule 7.*

**Note 2:** *A Club Task is one that has been set up by the Club Ladder Steward, on the ladder web site, in advance of the date of the flight. Such tasks may be flown in either direction and will always be scored as if pre-declared. They may be flown in addition to or instead of a pilot's main task.*

5. The pilot's word will be accepted for flight times, rounding TPs and landing positions except that BGA Trophies will only be awarded in each of the Ladder Competitions with the support of properly controlled GPS logger evidence.

### 5.1. Start and Finish

A valid start is made when the glider in free flight either crosses an imaginary line of length 12km drawn symmetrically through the start point at right-angles to the track of the first task leg, or leaves a 90-degree sector of infinite size positioned symmetrically towards the track of the first leg. If a valid start is not made, the task will be timed from launch.

A valid finish is made when the glider crosses an imaginary line of length 12km drawn symmetrically through the finish point at right-angles to the track of the last task leg; or enters a 90-degree sector of infinite size positioned symmetrically away from the track of the last leg; or, if the finish point is on an airfield, when the glider lands anywhere on the airfield.

## 5.2. Turnpoints.

In a single flight, the rounding of turnpoints will conform to the following:

- **FAI 90-degree sectors**, as for badge flights.
- **0.5km-radius cylinders (“Barrel Sectors”)** with the following provisos:
  - The scoring distance will be reduced by 1km per turnpoint.
  - Turnpoints may not be claimed by pilots not carrying GPS.

For the purposes of the ladder, the 0.5km-radius cylinder may also incorporate a 20km-radius 90-degree sector ("Thistle Sector"). The same provisos shown for barrel sectors will apply. Flights that use both types of turnpoint will be scored as using 0.5km radius cylinders for each turnpoint claimed.

- **Variable Sectors** with the following provisos:
  - Tasks using variable sectors may only be claimed when part of an organised handicapped distance competition or similar club-based group task.
  - The scoring distance will be reduced by the sum of the sector radii of the previous and current turnpoints.

## 5.3. GPS Logger Evidence

GPS logger files will be accepted provided that the file is either from a secure logger or has been downloaded to the satisfaction of the club ladder steward or his deputy who will then record that the flight has been properly controlled.

## 5.4. Barographs

Barograph traces must be submitted to Club Ladder Stewards for height claims. Logger files must be uploaded onto the web if pilots intend to submit height claims online.

6. Flights in gliders with motors are accepted. If the engine is used in flight after the task has started, the glider is scored to the furthest GPS position logged prior to engine start. If qualifying for a ladder trophy, GPS logger evidence is required to substantiate whether or where the engine was used.
7. Declarations must be made **before launching**, either electronically into a logger, or in writing and given to an authorised person as delegated by the club ladder steward. They must include the start point, up to four turning points and the finish point. A turnpoint is defined as a point on the surface of the earth precisely specified by a set of coordinates or represented by a trigraph contained in the Ladder Turnpoints List.

**Note 1:** Only one cross-country declaration may be made per flight. If two or more tasks are declared, full points may not be claimed for any of them. See also the note regarding multiple laps in Rule 4.

**Note 2:** While any task that includes 4 turnpoints is valid for the National Ladder, it will almost certainly **not be acceptable** for an FAI badge or record. Pilots must study the appropriate regulations for any claim that they might intend to make beyond that made in the National Ladder.

**Note 3:** Pilots may create their own library of waypoints specified by coordinates only. Such libraries may be used in addition to the BGA List of Turning Points for flight claims.

**Note 4:** Assigned Area Tasks (AATs) are to be scored as undeclared.

8. For undeclared and AAT flights, up to four BGA Ladder Turning Points may be used. If any other point is turned, the nearest BGA Ladder Turnpoint which gives a shorter scoring distance will be used for scoring purposes.
9. The competition handicap (Si) will apply to all cross-country tasks.

## 10. Uncompleted Tasks

A task is deemed to be incomplete if it is:

- **Abandoned:** The pilot did not reach a turnpoint (or even the start) on a declared task, but continued with the remainder of the task (ie: towards the next turnpoint) while remaining in soaring flight throughout. There may be no more than one point of abandonment in a single task.
- **Terminated:** It is not possible to continue with soaring flight, due to:
  - Landing out.
  - Engine Start.
  - Failure to reach a turnpoint having already used a point of abandonment.
  - Pilot-selected termination point.

**10.1** For declared tasks the distance achieved is the declared distance less the portion of the task that was not completed.

**10.2** For undeclared flights the full distance counts.

**10.3** For the purposes of calculating achieved distance, the termination point or abandonment point of a pre-declared task may be taken as (a) the furthest recorded GPS position on track or (b) a pilot-selected termination point from the GPS track.

**11.** Points are given for **Cross Country** distance and speed; and for **Height** gains.

**11.1.** Full **cross-country** points plus a bonus are awarded for **declared** flights where the declared start, turn and finish points are all rounded in the declared order **AND** the height loss between the start and finish points is the lesser of 1000m or 1% of the distance flown **AND** a logger file is posted on the web site.

**11.2.** If the height loss between the start and finish (or landing) points is greater than 1000m, a handicapped distance penalty will be applied at the rate of 1km per 10m over 1000m.

**11.3.** A proportion of full points will be given to **declared/incomplete flights** where a declaration was made but not achieved. A smaller proportion will be given to **undeclared** and **AAT** flights. No speed points will be awarded for undeclared flights that result in a landout.

**11.4.** **Height** points are awarded for gain of height.

**12. Calculation of Points**

**12.1. Cross Country Points**

**XC Points = Distance Points + Speed Points + Completion Bonus**

Depends on:

- 1) the shape of the task (its "merit") [shape factor]
- 2) whether it was declared or not [declaration factor]
- 3) whether it was "completed" or not [completion bonus factor]
- 4) the glider handicap
- 5) distance achieved
- 6) speed achieved over that distance

<b>SF</b>	Shape Factor	<b>Da</b>	Distance achieved
<b>DF</b>	Declaration factor	<b>Dh</b>	Handicapped distance achieved
<b>CF</b>	Completion factor	<b>T</b>	Task time (in hours)
<b>Si</b>	Glider handicap	<b>Va</b>	Actual speed
<b>Dd</b>	Distance declared	<b>Vh</b>	Handicapped speed

**12.1.1. Shape Factor**

The shape factor is derived by rules based on the overall geometry of the task rather than the number of turning points. The implication is that extra turning points and dog legs which do not affect the overall feel (or merit) of the task will **not** devalue it (by giving it a lower shape factor).

There are four bases for determining shape factors:

- **28% Triangle basis**  
If any three of the waypoints can make a 28% triangle whose total distance is  $\geq 95\%$  of the declared distance.
- **24%/45% Triangle basis**  
If any three of the waypoints can make a 25%/45% triangle whose total distance is  $\geq 95\%$  of the declared distance.
- **Goal basis**  
If the task is **not** closed circuit (a goal). A task is considered closed circuit if the start and finish points are within 10km of each other.
- **Normal basis**  
If the task does not fit into any of the other basis then its shape factor is calculated from the ratio of the task length to the length of the "convex hull" that contains all its points. This geometry of this results in ratios from 0.5 for a double out and return to 1.0 for any convex shape. This range of ratios is then scaled to give shape factors between 0.82 and 1.00. Please see the examples.

<b>SF</b>	= 1.08 for the 28% triangle basis
	= 1.05 for the 25/45 triangle basis
	= 0.82 for the goal basis
	= between 0.82 and 1.00 for the normal basis

**Note 1: Example** A pilot declares what is basically a 500k 28% triangle, but must dog-leg around some airspace which adds 20k to their total distance. The shape factor will be 1.08, but the total distance will be 520k, the speed will be calculated over 520k and the flight will be scored as such.

**Note 2:** If pilots are going for records or badges they must make sure that their tasks also adhere to the rules for these.

#### 12.1.2. Declaration Factor

**DF** = 1.00 for declared flights (fixed sectors)  
= 0.90 for declared flights (variable sectors)  
= 0.75 for undeclared flights  
= 0.75 for AAT flights

#### 12.1.3. Completion Factor

**CF** = 1.10 for completed flights  
= 1.00 for uncompleted flights

**Note 1:** Amounts to a 10% points bonus for completed tasks.

**Note 2:** Undeclared flights are only regarded as completed if they are closed-circuit (distance between start and finish points is less than 10km)

#### 12.1.4. Distance Points

Are awarded for handicapped achieved distance and are factored by the shape factor and declaration factor.

**Da** = distance achieved (marking distance)  
**Dd** = declared distance  
= Da for undeclared tasks  
**Dh** =  $Da * 100 / Si$   
**Dpoints** =  $5 * Dh * SF * DF$

#### 12.1.5. Speed Points

Are awarded for handicapped speed over the achieved distance, are factored by the shape factor, declaration factor, handicapped distance flown and are devalued depending on the fraction of the task that was completed.

**Va** =  $Da / T$   
**Vh** =  $Va * 100 / Si$   
**Vpoints** =  $0.05 * (Vh - 50) * Dh * (Da / Dd) * SF * DF$  [Vh > 50]  
= zero [Vh <= 50]

**Note 1:** Speed points cannot be negative. ie: handicapped speeds of less than 50kph will score zero speed points

**Note 2:** Speed points will only be awarded after the flight's logger file has been uploaded to the BGA Ladder website.

#### 12.1.6. Completion Bonus Points

For "completed" tasks a bonus of 10% of both speed and distance points is awarded. See 12.1.3 for the definition of "completed" and the completion factor.

**Bonus** =  $(Dpoints + Vpoints) * (CF - 1)$

#### 12.1.7. Total Points

Simply the sum of the distance, speed and bonus points, rounded to the nearest whole number.

**Total** =  $ROUND(Dpoints + Vpoints + Bonus)$

#### 12.1.7. Full Formula

The full formula combines all the above:

**XCPoints** =  $ROUND((SF * DF * CF) * (5 * Dh + 0.05 * (Vh-50) * Dh * (Da/Dd)))$

#### 12.2. Height Points

**HPoints** =  $((\text{height gain in feet}) - 5000) / 10$

13. Details of each flight must be submitted, either online by the pilot or via the Club Ladder Steward, within 14 days of the flight taking place. Full details of flights, including GPS Logger evidence when available, must be submitted to the National Ladder Steward within 14 days of being requested. A 10% penalty will be imposed for late entries.

For flights made during January of each season, the 14-day rule will be extended to the whole of January, in order to accommodate any rule changes that will be implemented on January 15th each year.

After the start of a new season in January, late entries may not be posted for flights earlier than December of the previous season.

14. Trophies are awarded to the highest scoring pilots Open, Weekend, Junior and Vintage ladders, as follows:

➤	<b>Open Ladder</b>	<b>Winner</b> <b>Runner-Up</b>	Enigma Trophy Firth Vickers Trophy
➤	<b>Weekend Ladder</b>	<b>Winner</b> <b>Runner-Up</b>	L. duGarde Peach Trophy Slingsby Trophy
➤	<b>Junior Ladder</b>	<b>Winner</b>	Spitfire Trophy
➤	<b>Vintage Ladder</b>	<b>Winner</b>	Chris Wills Vintage Glider Trophy

*Note 1: Supporting logger evidence must be posted on this site in order for BGA Ladder Trophies to be awarded.*

*Note 2: BGA Trophies will not be awarded if supported by logger files that show unapproved airspace penetration.*

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## APPENDIX A: RACING LADDERS

The Racing Ladders are based on the average of the fastest handicapped speeds around tasks of 100km, 200km and 300km.

A1. There will be two Racing Ladders:

- **FAI Racing Ladder** Handicapped speed-only flights around FAI 28% triangles (as defined by Rule 12.1.1.)
- **Open Racing Ladder** Modified handicapped speed flights around any task shape.

A2. To qualify for these ladders, flights must be declared, completed and comply with the maximum 1000m height loss rule. In addition, the FAI Racing Ladder will require logger files to be posted.

A3. Task details will be taken from the normal ladder claims process. Claims that have been subjected to a late-submission penalty may not be included.

A4. The three task sizes are defined by the actual unhandicapped scoring distance:

- **100km** Distance 100.0km-199.9km
- **200km** Distance 200.0km-299.9km
- **300km** Distance 300.0km-399.9km

A5. Scoring speeds are calculated as follows:

- **FAI Racing Ladder** Actual handicapped speed
  - **Open Racing Ladder** Handicapped speed modified by the task shape factor (Rule 12.1.1)
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