UK rated gliding competition scoring explained

Introduction

The scoring system used in rated gliding competitions is necessarily* complicated and quite difficult for the average glider pilot to fully understand. To do so calls for close study of the mathematical scoring formulae set out in the rulebook and, of course, many of us don't find this easy. This paper attempts to demystify the scoring system by explaining it in plain English.

*See "A bit more detail" below

Task types

From the point of view of the scoring formulae, it is necessary to consider only two task types:

- Fixed Course Task (FCT)
- Assigned Area Task (AAT)

This is because Distance Handicapped Tasks (DHTs) in rated competitions are treated as a special kind of FCT and while the scoring process is slightly different (DHTs deal with the handicap issue by having the gliders fly different distances in the first place, so they are actually scored as unhandicapped), the formulae used are the same for both. For that reason, in this paper, the term FCT can be taken to include DHT. On the other hand, AATs do have some significant differences that need to be explained.

The basic 1,000-point scoring system

First, let's look at the basic features of the scoring system common to all task types:

- The most any competitor can score on any day is known as the Day Points.
- The maximum Day Points is 1,000.
- To keep points scores comparable from day to day and from contest to contest, factors are used in the calculation of Day Points to reduce the points available on days when tasks are short, speeds very high, or not enough gliders go far enough (see 'Devaluation' later for a fuller explanation).
- First, taking account of any devaluation required for the reasons mentioned above, the number of Day Points is decided.
- Next, Day Points are split into Day Speed Points and Day Distance Points. These are the maximum that any competitor can score for speed and distance respectively.
- Day Speed Points are decided first. The maximum is two-thirds of the Day Points. That happens when everyone who launched finishes and does so more than two-thirds as fast as the fastest. The Day Speed Points reduce linearly as the proportion of sufficiently fast finishers reduces and is zero when there are no finishers.
- Day Distance Points are whatever is left after the Day Speed Points are subtracted from the Day Points.
- Distance scores are based on distances flown after adjustment for wind and glider Speed Index. See Handicapping and Windicapping below for more information on this.

Differences between FCTs and AATs

The difference between FCT and AAT scoring comes in the calculation of the points awarded to individual competitors (Glider Speed Points and Glider Distance Points). These are calculated slightly differently for the different task types, but before we look at that we need to know about a scoring parameter unique to AATs; Minimum Time:

AAT Minimum Time

Every AAT has a Minimum Time (until recently known as Designated Time). It has only two functions in scoring:

1. Its principal use is in calculating your speed.... but only if you finish early (ie in less than the Minimum Time). Your speed is calculated by dividing your distance by your time, but in an AAT your time cannot be less than the Minimum Time, so early finishers are penalised by being credited with a speed slower than they actually achieved.
2. It is also used as the time devaluation factor for AATs. (See Time Devaluation below)

Calculation of Glider Speed Points

To get any speed points you have to cross the finish line having achieved a speed greater than two-thirds of the fastest finisher's speed.

The number of Speed Points that you get starts at a very small amount when your speed is only just over two-thirds of the fastest and rises to the maximum when your speed is (or is equal to) the fastest.

In an AAT however, as explained above, if you finish before the Minimum Time has elapsed the speed used in the calculation of your speed points will be lower than your actual speed.

Calculation of Glider Distance Points

Non-Finishers

- In both FCTs and AATs, non-finishers are treated in the same way. They all get a proportion of the Day Distance Points according to the ratio of their distance to the greatest distance.
- Note that, in an AAT, since everyone flies a different course, the greatest distance could be done by a non-finisher. This pilot would receive maximum distance points but, of course, no speed points.

Finishers

- In FCTs all finishers get maximum distance points.
- In AATs, only those finishers who go further than two-thirds of the greatest distance get maximum distance points.
- Other AAT finishers get a proportion of Day Distance Points equal to the ratio of their distance to two-thirds of the greatest distance.

A bit more detail

Devaluation

From a sporting point of view, it is desirable that performances of similar merit should produce similar scores. This is especially true when, as in rated gliding competitions, the scores are later used in pilot ranking systems to determine priority of entry to other competitions.

Accepting the above as a principle, it is necessary to have mechanisms in the scoring system to adjust the total points awarded from day to day to reflect the "value" of the day. Generally, the value of the day can be thought of as a combination of how "hard" the task was and how well the day's performances arose as a result of piloting and decision-making skills, as opposed to blind luck. Very short tasks and tasks completed very quickly will be of lesser value and, when a day ends with a few good performances when most pilots struggled, luck is assumed to have played a large part, so these mechanisms tend to look at those things. There are three such mechanisms in the scoring system, each of which produces a potential Day Points result. The smallest number of Day Points arising from any of the three is the one that is chosen.

Day Factor and Qualifying Distance "Y"

The first such mechanism simply multiplies the nominal 1,000 points by a Day Factor, which is always less than or equal to 1. The Day Factor is determined by the proportion of pilots in the competition (whether they launched that day or not) who make it past the Qualifying Distance "Y". If 80% or more make it past Y the Day Factor will be 1 and so it will be a 1,000-point day, provided neither of the other two devaluation mechanisms produces a smaller number. As the proportion of pilots who pass Y reduces from 80%, the Day Factor reduces in proportion, so if the percentage past Y halves, for instance, the Day factor also halves. At 40% past Y, then, the day factor is 0.5 so, if not further devalued by either of the other two mechanisms, the Day Points will be 500.

The value of Y itself depends on competition class and task type and is subject to minima and maxima, but is always a sizeable portion (around 40% to 50%) of the achievable distance. There is a table in the rulebook (appendix 7.2.1) that sets out how Y is determined.

Distance devaluation

The second devaluation mechanism looks at achieved distances*. If less than a set amount (250km for a regular Nationals or 200km for a Regionals or Junior Nationals) the formula, which also takes the Day Factor into account, will produce a lower number of Day Points than just the Day Factor on its own and may be the one that decides the Day Points.

*For FCTs the winner's marking distance is used. For AATs it is the greatest marking distance flown by any competitor (who, in an AAT, may not be the winner).

Time devaluation

The third devaluation mechanism looks at task times*. If shorter than a set time (3 hours for a Regular Nationals or 2.5 hours for a Regionals or Junior Nationals) the formula, which also takes the Day Factor into account, will produce a lower number of Day Points than just the Day Factor on its own and may be the one that decides the Day Points.

* For FCTs, the winner's time is used. For AATs it is the Minimum Time.

Task minima

Each type of rated competition is subject to a task minimum. For FCTs it is the published task distance. For AATs, it is the published Minimum Time. Since these are set by the organiser, it is unlikely that a task would be set with less than the minimum distance or time, but if that were to happen through an error, the day would be forfeit by having the Day Points set to Zero by the scoring system.

The minima are published in appendix 7.2.2 of the rulebook.

Handicapping

Handicapping is the adjustment of scores according to the published Speed Indices (often just called "handicaps") of the competing gliders so as to eliminate glider performance as a factor in deciding the outcome of the competition. It is used only in Regionals and in Club Class, Junior and 20m Multi-Seat Nationals.

In the scoring system, handicapping is implemented by dividing the actual distance flown by a glider by its Speed Index (expressed as a percentage) to produce a "Marking Distance", which may be greater or less than the actual distance flown depending on whether the Speed Index of the glider is less than or greater than 100%.

Windicapping

Windicapping is the adjustment of distance scoring to take account of the effect of the wind. As an illustration, imagine two pilots competing on a windy day. One achieves 50km directly into the strong wind to the first turning point and lands out. The other makes it round the first turning point and then flies a further 50km more or less downwind before landing out near the second turning point. The second has flown twice as far as the first. Does that mean he/she should receive twice as many distance points? No. the struggle to the first turning point must surely be worth more than the downwind-dash to the second. Windicapping takes care of that.

It is implemented by adjusting the glider speed index on a leg by leg basis, taking into account the strength of headwind or tailwind on each leg in turn, calculating separate marking distances for each leg, then adding the leg marking distances to produce a total marking distance. It is used in all rated competitions. Note that although Nationals are unhandicapped, the application of windicapping is still done by adjusting speed indices, it's just that gliders in an unhandicapped competition are given the same nominal 100% speed index.

The wind speed and direction used in the calculation is determined by examination of flight traces to give a "Contest Wind" which is used in scoring all flights that day. In the large span and flapped Nationals (Open, 18m 15m and 20m Multi-seat) the Contest Wind is reduced by a factor which is intended to recognise the lesser impact of wind on the higher-performance gliders. The factors are published in appendix 7.2.2 of the rulebook. Note that Contest Wind (after any adjustment) is limited to a maximum of 30 knots, even if the actual wind was higher.

Note also that, in DHTs, handicapping and windicapping is not done in the scoring, but is taken account of in setting the barrel-sizes. The windicapping element uses a forecast contest wind instead of an actual contest wind extracted from flight traces.

Some points to note

You don't get landed out at the end of Minimum Time in an AAT

Contrary to a common misunderstanding, Minimum Time has no effect at all on your distance score. In other words, any distance you do after it has expired still counts. You definitely **don't** get landed out at the end of Minimum Time.

Finishing late in an AAT is OK

A late finish in an AAT implies a low speed or a large distance, or both. If others have done better, a low speed could certainly mean fewer (or perhaps no) speed points, but there is no other way in which finishing late can reduce your score. The further you go the better your chance of gaining maximum distance points and if you can increase your distance while preserving (or even improving) your speed, you will benefit. Whatever happens, don't miss out on points unnecessarily for fear of a late finish.

Speed isn't everything in an AAT

In an FCT, the fastest finisher is always the winner (disregarding penalties, of course), but this may not be the case in an AAT, if the pilot failed to go far enough.

Points spread is what counts

While a 1,000-point day usually means a fun day for most pilots and a seriously devalued day can mean disappointing scores for those who did well, a day doesn't have to be a "Thousand Pointer" to be a good contest day. If everyone is bunched together at the top of the points, it means the day hasn't made a lot of difference to the overall score for the competition. On the other hand, even a day with less than 1,000 points where there is a large points spread will have a big influence on final placings. Pilots shouldn't be overly concerned when the day, perhaps unexpectedly, produces fewer than 1,000 points, but should look at the points spread that results. If you are one of a handful of finishers on a low-points day, but you are disappointed with your low points score, look again, it could still mean as big a difference between you and your rival as you achieved in yesterday's boomer.

IGC rules for international competitions

One final point: All of the above refers to the scoring system used by the BGA for British Rated Competitions. If you find yourself competing in an international gliding competition under IGC rules, you will notice a small number of significant differences between the UK and IGC scoring systems. The two are actually very similar and, if you understand one, you will quickly grasp the other, but they are managed by different bodies and have diverged slightly. The BGA Competitions Committee keeps these differences under review and will adopt IGC changes if they are seen to be appropriate to British gliding.

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