LEVELLING THE PLAYING FIELD

Tim Scott provides a helpful guide to setting fair and enjoyable tasks and highlights the tactical challenges facing those who fly Handicap Distance Tasks

THE new Handicap Distance Tasks (HDT) are gaining in popularity amongst British glider pilots and in many other countries around the world, with interest from the USA, South Africa, Brazil, Australia, New Zealand and others. All of them see the virtue in running handicap competitions using this new format. Some of the countries with smaller numbers of glider pilots are even seeing this as a possible way to rejuvenate their national championship by allowing a wide range of handicaps to compete fairly against each other.

In 2015, the Booker Regionals flew only HDT tasks. We flew on six days, some very good, some quite challenging and the result was brilliant. A Ventus 2Cxt won, an ASW 27 was second, with a Libelle third. In fact, the mix of glider types down the results list did not seem to reflect any sort of handicap bias at all. The task format had delivered what we had set out to achieve: fair and fun racing across a wide range of handicaps.

More encouraging was that, even on the most difficult days, nearly everyone had a go at completing the task. The lower handicap glider pilots did not feel the task was beyond them even when it was windy and showery.

HDT tasks not only bring more pilots into competitions, but they add a racing touch to our usual weekend cross-country flying. It's 'racing for all'.

Not that HDT tasks have been flown without occasional hiccups. Looking into the rare occasions when they haven't worked as well as expected nearly always led to the conclusion that the task could have been better set. This is not surprising as setting a Handicap Distance Task does take care and at Booker we have made our share of mistakes. Fortunately Booker uses HDTs extensively for club flying, so we are a year or so ahead in our experience of setting them. So far we have managed to avoid most, but not all, of those pitfalls for our Regionals. I thought it would be helpful to highlight potential issues and show how to avoid them for your club's Regionals, or just for a fun racing weekend.

Although this is aimed at task setters, it will be useful for any pilots interested in this new racing format. HDT is an ideal one-class format for informal weekend racing. The software makes it easy for any cross-country pilot to set an HDT task. Not only will this article help them to get the task setting right – but it also suggests the kind of tactical challenges that face the pilots who fly them.

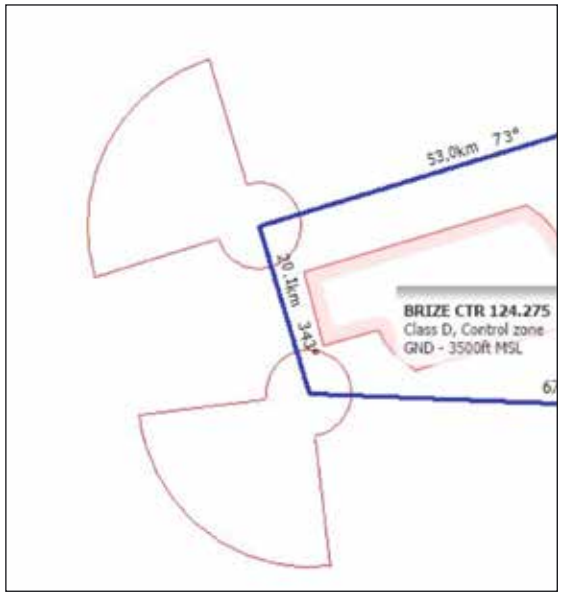


Figure 1

■ For practical experience visit Booker GC, where HDT tasks are flown most weekends in the season and for all tasks in the Booker Regionals (2-10 July 2016)

Preparation

For Booker we decided that we would generate a set of standard tasks, ahead of the competition, that could be carefully checked for problems. Now we have a standard library which can be tweaked on the day to optimise the task for the prevailing conditions (weather and notams for example) and for pilots' experience levels. For the Regionals this greatly assisted myself and the director, Richard Crockett, in setting the tasks.

We strongly suggest that each club pre-set some tasks. This exercise, done with more than one person participating, acts as a valuable training exercise to improve the task setting skills of all involved as well as producing a library of tasks.

First a recap of the way the tasks are structured. The idea is that every glider in a handicap competition flies the same windicapped distance. To achieve this aim, the diameters of the barrels at the turn points are adjusted such that the low handicap gliders turn the point earlier down the leg than the high handicap glider. To calculate the required barrel size for each TP there is software into which the base task is input, along with the forecast wind and the range of glider handicaps. The software produces a table that allocates a turn point radius for each handicap.

The result of this is that not all the gliders are flying exactly the same task and this can

catch out the unwary task setter.

The HDT task setting software has been specifically designed to help avoid the possible problems that can creep into a poorly set task. Specifically, the software can export the HDT directly into SeeYou thus allowing the task setter to easily inspect the task they have set for the range of handicaps involved and check that none of the possible traps have been fallen into. I used this extensively during the Booker Regionals and it did enable me to notice a few problems with the tasks I had set initially and correct them.

I would therefore suggest the following work flow when setting an HDT task.

- Set the task in SeeYou taking into account the usual factors of weather, airspace and NOTAMs
- Set the task in the HDT task setting software for the range of handicaps and wind that is forecast
- Export the task from HDT to SeeYou and carefully check that none of the following issues have occurred now that you can see the full range of tasks to be flown.

So where do we need to be careful?

1) The task for the lower handicap gliders goes through controlled airspace.

This happens when the task is set around the corner of some controlled airspace. Brize Norton zone is a classic for this, but there are other examples in the UK's crowded airspace environment.

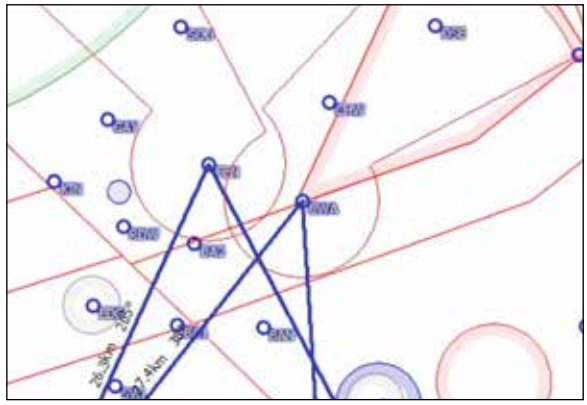
If the TPs are placed such that the high handicap gliders just make it around an airspace corner then all lower handicap gliders will have a problem. In fact, they might have to continue to the 0.5km point in order to avoid the airspace, completely negating their handicap advantage.

Figure 1 (far left) clearly illustrates the problem. A low handicap glider turning the variable barrels at the track-in/ track-out intersections would infringe the Brize Zone unless a course is taken to avoid it, but that will increase the distance flown to the disadvantage of that glider.

2) Setting a TP just inside the edge of lower airspace.

This is a more subtle problem and more common. If the task is set towards lowering airspace then it can happen that the high handicap glider has to descend in order to turn a TP that the lower handicap glider can turn at a greater height. The example shown in figure 2 (above right) shows the situation for two TPs.

The TP at CWA is actually OK, just. All



■ FREE Handicap Distance Task planning software, introductory videos and a complete guide to the Handicap Task Suite Contents are available for download at: *www.handicaptask.uk*

Left: figure 2

gliders can turn under the higher airspace. This is still not an ideal TP and it is included just for illustration purposes. The high handicap pilot would probably feel a little uncomfortable turning this TP without descending and also they have only a small part of the 0.5km barrel to aim for.

The TP at FEN is totally unacceptable. The lowest handicap gliders have the luxury of turning the TP at altitude, albeit not at the optimum point. But the higher handicap gliders have to penetrate the lower airspace for a considerable distance going in to the TP and coming out.

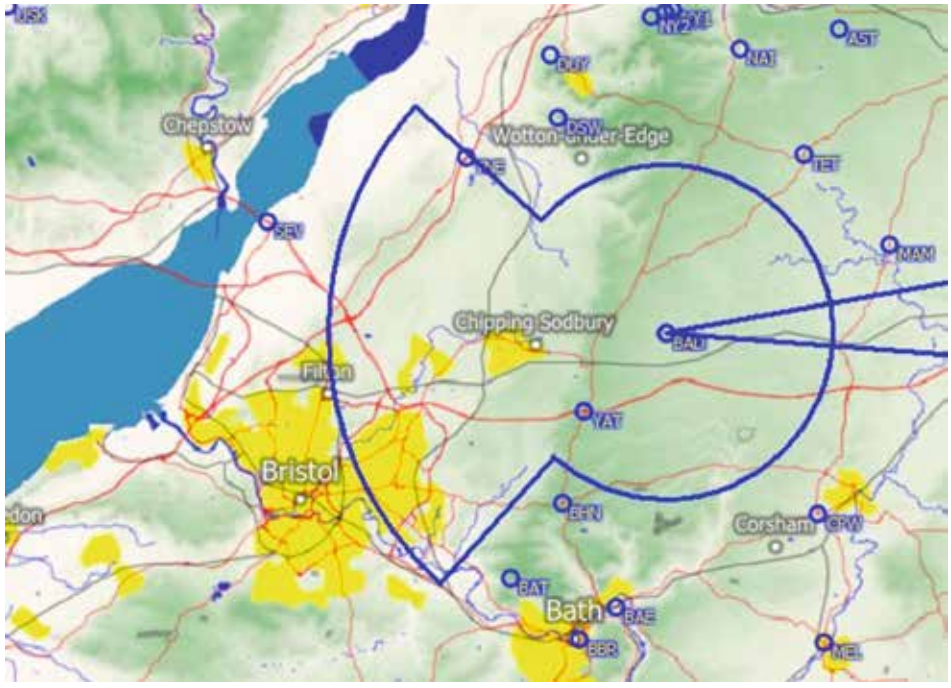
Again the task setting flow suggested previously should allow the vigilant task setter to avoid this trap and the subsequent penalty in buying lots of beer that it entails.

THE HDT TASK SETTING SOFTWARE HAS BEEN SPECIFICALLY DESIGNED TO HELP AVOID THE POSSIBLE PROBLEMS THAT CAN CREEP INTO A POORLY SET TASK

3) Sea breezes

This was a mistake that was actually made during the Booker Regionals. The task was

Below: figure 3



THINK HARD ABOUT THE EFFECT THAT ANY AIRMASS CHANGE MIGHT HAVE ON THE VARIOUS POINTS AT WHICH COMPETITORS CAN TURN

■ Tim Scott and Jim White have been awarded the John Hands Trophy for outstanding support in the organising or running of competitions. It was presented this year for the creation of software and pioneer influence to support the introduction of the Distance Handicapped Tasks now used in BGA Regional events and at club level. Tim has also supported the creation of scripts for BGA scoring over many years.

towards the Seven Estuary in a westerly wind. In this case, the low handicap gliders could turn before reaching the area affected by Severn Estuary sea breeze, whereas the high handicap gliders had to penetrate it to a considerable distance – a definite disadvantage. To avoid this trap, think hard about the effect that any airmass change might have on the various points at which competitors can turn. Again exporting the task back into SeeYou can help visualise the potential pitfalls and allow them to be avoided. Figure 3 (on page 23) makes the point.

4) Lake effects

This follows on from the sea breeze problem above, but it is more subtle and is again down to anticipating the effect of airmass boundaries on different competitors' TP possibilities.

The task as presented on figure 4a (below left) looks reasonably well set. The airspace issues have been avoided and, unless there is a strong easterly, there would appear to be no real sea breeze effects to worry about.

But now look at figure 4b (below right). With the terrain now overlaid on the task, the problem becomes more apparent. Rutland Water is a big lake, especially if traversed from west to east! Even bigger if you then have to turn around and cross back from east to west. This TP is clearly requiring the high handicap gliders to do a double traverse of a pretty unsoarable bit of terrain, whereas the low handicap pilot gets to turn before the problem starts. This clearly puts the high handicap pilot at a disadvantage.

Exporting of the task back into SeeYou should help avoid this issue. However, in this case it may be advisable to ensure that the terrain layer is turned on as well, if only briefly, just to check for situations such as this.

5) Task geometry

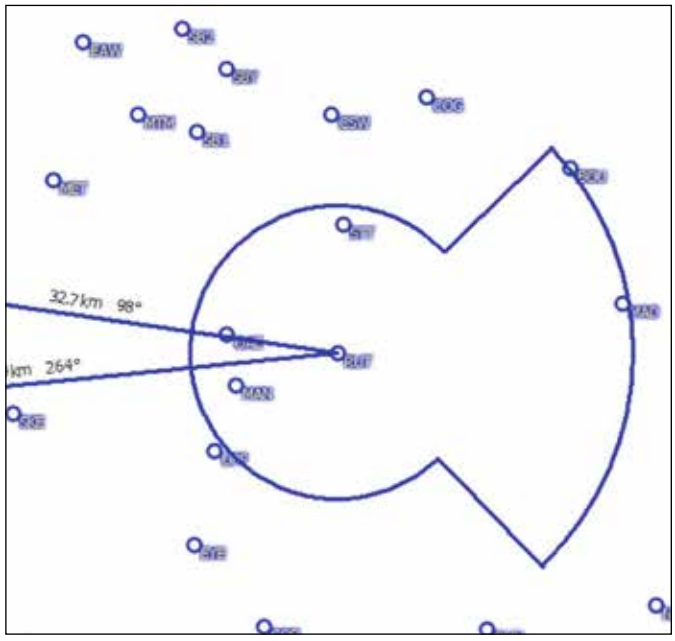
With these tasks, it is important to understand a little bit about how the geometry of the task affects the required barrel sizes.

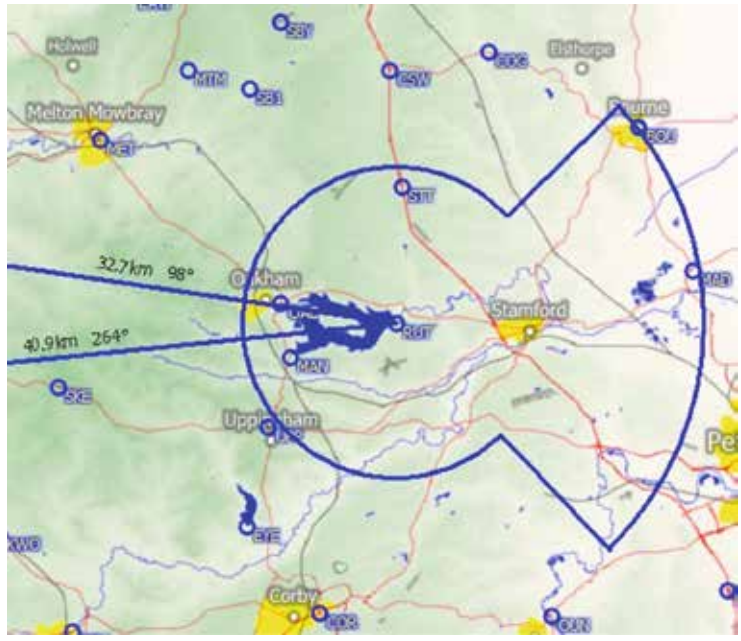
When setting HDTs, I tend to view a TP as an opportunity to "use up" distance for low handicap gliders. This mindset causes me to think in terms of setting fairly acute TPs where possible. By acute I mean any angle up to around 90 degrees. If I need a shallower angle at a TP, to go around airspace say, then I consider using a 0.5km checkpoint instead. This also helps to avoid the airspace issues mentioned above.

This approach also leads me to consider how many TPs a given task length is going to require. In general I try to keep barrel sizes to less than 10km or so. If the task is a long one, then there may be quite a difference in the distance flown by a 100 handicap glider and an 80 handicap one. For a 300km flight the 100 handicap flies 300km, but, in nil wind, the 80 handicap flies only 240km. That is 60km I need to get rid of somewhere. With one TP with 180 degree turn I have a maximum barrel size of 30km. Clearly unacceptable. With three such TPs (ie double out-and-return) I wind up with a barrel size of just 10km, which is perfectly OK.

When planning a task, use the task setting

Below left: figure 4a
Below right: figure 4b





software itself to try out a few ideas for the handicap spread you are setting for and seeing what effect increasing the number of TPs has on the maximum barrel size that is required.

Here is an example of the effect of adding just one TP to a task to reduce the barrel size.

Suppose we want a task of around 300km. We could set Turville Windmill, Andover SE, Kibworth, Booker Airfield. A perfectly reasonable looking task. A few airspace issues, but none near TPs so that's OK, and a distance of 316km. Putting this into the HDT software and using handicaps of 111 (an ASG 29 18m or Ventus 2CXa) down to 89 (Libelle), we get barrel sizes with zero wind of between 0.5km up to 16.4km. but 16km is a bit big for a barrel.

We can solve this problem by adding an extra TP. So let's try a slightly different task: Turville Windmill, Pitsford, Ilsley, Northampton South, Booker. This is 315km, so almost the same as the previous example, but has three TPs. Now the barrel for the 111 handicap is still 0.5km of course, but for the 89 handicap it is now 10.9km.

This is the logic by which we came up with the figure of around 10km being the maximum barrel size that is advisable.

6) Use of checkpoints

Checkpoints were introduced to the task setting arsenal initially to help with airfields, such as Husbands Bosworth, which have a relatively narrow area or runway to land on. It enables the setting of a checkpoint that all competitors must turn at 0.5km in order to align them with the runway to make final gliding safer. In addition, a large barrel close to the airfield means that gliders are coming back to the airfield on converging rather than parallel tracks. Using a checkpoint as the last TP avoids this problem and also make pilots more aware of others in the vicinity. This is valuable in letting them negotiate with each other on the radio as to how they will integrate with each other in the circuit. Unless the last TP is a considerable distance from the airfield I would always suggest using a checkpoint lined up with the runway at around 10km out.

However, there is nothing in the rules to say that they cannot be used in other situations. They have been used to steer pilots away from airspace and NOTAM'd areas in situations where normal barrels will not suffice.

Figure 5 (above) is an example taken from a task at Booker. Coming up from the south there is the problem with the airspace that's highlighted on the map. Although it is at 4,500ft, taking a straight line through this towards Booker also infringes on 3,500ft and 2,500ft airspace. For high handicap gliders this is not an issue as they can glide straight in under the airspace and are happily above glide. For lower handicap gliders this is not so easy, requiring them to take a thermal from a relatively low height. So we decided to create a turnpoint at Huntercombe, which is now in the BGA list, to allow us to add a checkpoint to take everyone around it. Obviously using this as a variable barrel would not work. The low handicap gliders would then be turning under the airspace the checkpoint is designed to avoid. But using it as a checkpoint works beautifully. It gets all the gliders around the airspace and also gets them all on the same final glide track when still 15km from the finish line. In addition we also go around BO5 at Booker just to avoid the power pilots' climb out and align ourselves with the glider landing area. So this is a great example of using checkpoints to go around controlled airspace and align the finishers with the airfield runway.

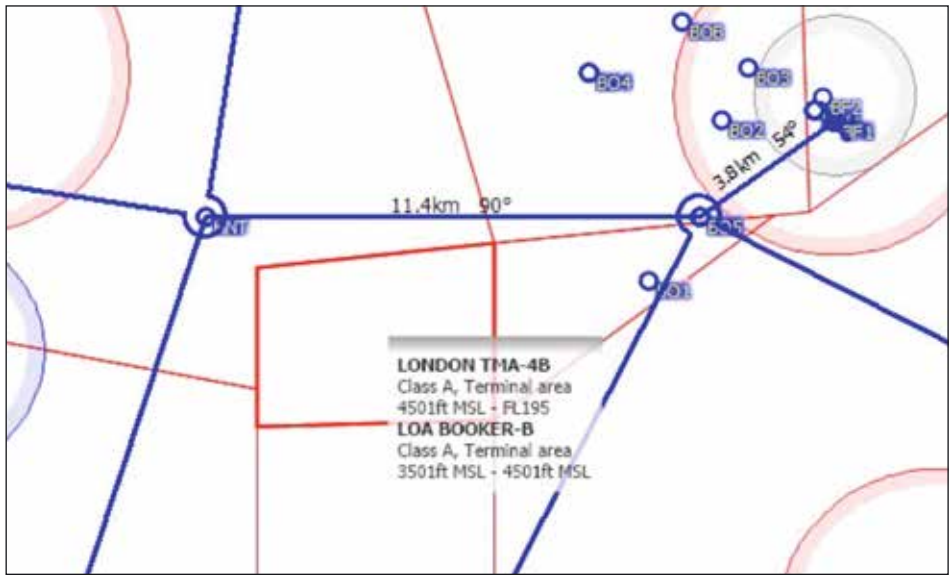


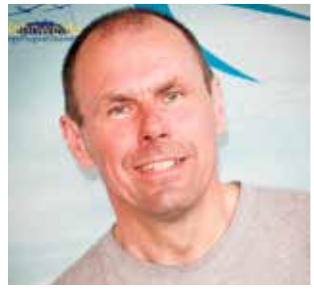
Figure 5

7) Use of shower sectors

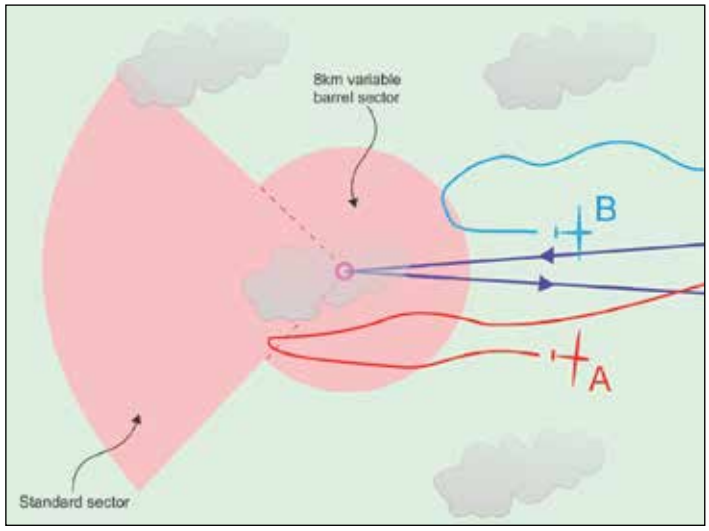
If there is any chance of a shower, then I would recommend the use of the shower sector. I can explain the reasons with figures 6a and 6b (overleaf on page 25).

First let's look at the situation with a standard sector. If there was a shower over the TP the high handicap pilot has to go a long way past the TP to be able to get into the sector and claim the TP.

The glider with an 8km sector, however, has many more opportunities to get into the sector due to the relatively gentle



Tim Scott went solo on his 16th birthday in 1979. He flew his first Junior European Champs in Cambrai, France, in 1989. Tim has been part of the British Team for many international comps, flying in three classes (Standard, 15m and Open). He owns an ASG 29 and this year plans to fly the UK 15m Nationals and Hahnweide 15m Class. An airline pilot by profession, Tim is task setting the Booker Regionals again this year



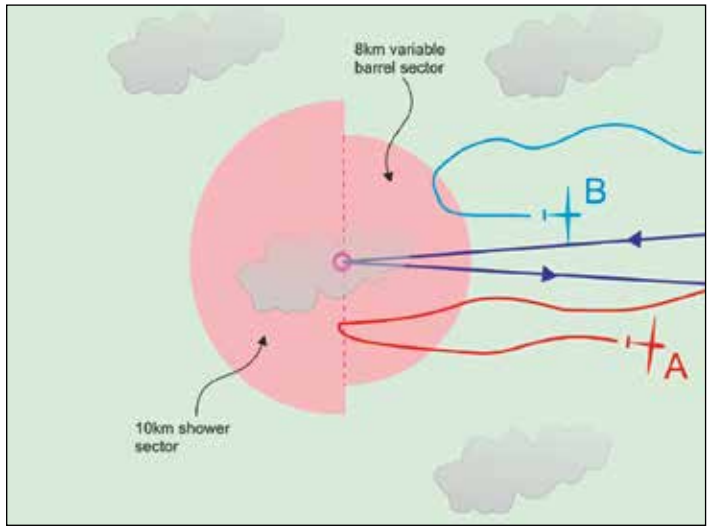


Figure 6a (above left): In showery conditions with a shower over the TP, high handicap glider A has to fly way past the turnpoint to claim it. Low handicap glider B has many options to turn along the curve of the 8km barrel. An unfair advantage for glider B

Figure 6b (above right): Using a shower sector, high handicap glider A can make good the turnpoint flying very little further than the 0.5km barrel. This overcomes the unfair advantage for glider B shown in figure 6a

(Illustrations from SeeYou and by William Parker)

EVERYONE GETS OPPORTUNITY TO FLY IN THE SAME WEATHER WINDOW AND RACE IN REAL TIME

curvature of the 8km boundary line, at the expense of flying just a little further. Clearly this gives a large advantage to the lower handicap glider. If, however, we specify the showery sector option the situation can be seen to be much fairer.

The extended sector is of very little use to the low handicap glider at all. Of course, once the barrel gets to over 10km there is no extended sector for the low handicap glider.

Those gliders with handicaps in the mid-range get an increasing barrel to aim at, as their handicap goes down at the expense of the extended sector becoming less and less useful as it is further from their optimum turning point on the barrel.

Don't forget that the rule book allows for the use of showery sectors only when the angle at the TP is less than 90 degrees. But then for HDTs this is desirable anyway.

Summary

If the above guidelines are followed then the setting of Handicap Distance Tasks should be a pain-free experience. Those clubs that have adopted the task format are reporting that they are great fun to fly at both club and competition level. I know from conversations with pilots at Booker they have rekindled a desire to go racing.

With some foresight and careful planning the HDTs offer a much more level playing field for handicap competitions. Everyone gets the opportunity to fly in the same weather window and race in real time against each other. Never before in a handicap competition have I stopped to worry about where that Libelle has got to once I've passed it once in my ASG 29. Now, however, I find I'm looking for all the gliders in the competition down every leg to see how I'm doing relative to them. This has added a real excitement to handicap racing that to my mind had been lacking up to now.

So this new task actually levels the playing field for all. The low handicap gliders no longer have to fly in the weather at the ends of the day, but also they can no longer just use other higher handicap gliders to help pull them along. The tactics have changed and I, for one, have certainly not fully worked out what the new tactics should be yet.