

# FAIR HANDICAP RACING IT IS POSSIBLE

STUART CRESSWELL'S  
GUIDE TO

## AVERAGE LAP RACING



TECHNICAL

One row is used for each boat.

The classes and sail numbers and start delays can be entered from the entry list. It is wise to group classes and boats starting in the same fleet together. The columns are:

1	class
2	sail no
3 to 11	round ticks (One tick for each round recorded on Form 1)
12	total of rounds completed
13,14,15	hour, minute, second of finish time
16	start delay (minutes) for fleet
17,18,19	elapsed time hour, minute, second
20	elapsed time seconds
21	Portsmouth Number
22	corrected time seconds
23	finish position

The form is best used with two people. One writes while the other reads class and sail numbers and finish times from Form 1.

When all the data is transferred from Form 1 the calculations are made in accordance with the guide.

#### Viewpoint 5

**Spectators, Press and Television: Average Lap Racing is spectacular - what can you expect to see?**

By early on in the race, boats are spread out all round the small course and the race officers have to keep constant vigilance to ensure that everyone is correctly lap counted - it is much busier than a conventional three lap race though at no time worse than at the end of a closely sailed pursuit race!

In a pursuit race you can see how boats are progressing through the fleet, and in a normal handicap race you can time competitors at marks and assess their relative corrected positions, but in an Average Lap Race it is almost impossible to know how they stand. This may be a psychological disadvantage but at least means that competitors concentrate on fast sailing. Often however individual competitors will have 'markers', with the same or similar handicaps, against whom to gauge their performance.

As a spectator event, the Average Lap Race suffers the same problem as an ordinary handicap race - it is difficult to know at a glance who is winning. However it does have a major advantage in that, using a small course with many boats in a small area, spectators, photographers and television can see the manoeuvring and enjoy the spectacle.

algi891 11sep1998

10 under 18 Scoring

include:  
The Low Points scoring system, rule A2 (or other chosen system), will apply with the modifications below.

Handicap numbers will be as published in YR2/(xx) (or other publication) (or as listed in Appendix x)

Corrected times will be calculated using the formula:

$$\text{CorrectedTime} = (\text{ElapsedTime} * \text{MostLaps} * 1000) / (\text{HandicapNumber} * \text{ActualLaps})$$

where:

**ElapsedTime** = elapsed time of boat

**MostLaps** = rounds sailed by boat completing most rounds

**HandicapNumber** = handicap number

**ActualLaps** = rounds sailed by boat under calculation

If as a result of applying the correction formula of SI (number of the one above), a boat is given a greater corrected time than others with the same handicap number but which have completed fewer rounds, then the following procedure will be applied to boats in that handicap number group only. Boats completing one round fewer than the leading boat of the handicap number group will have their corrected times recalculated thus:

$$\text{ModifiedCorrectedTime} = \text{CorrectedTime} * \text{Multiplier}$$

$$\text{Multiplier} = \text{Slowest} * (\text{FastestLaps}-1) / (\text{AboutToFinishTime} * \text{FastestLaps})$$

where

**FastestLaps** = number of rounds completed by fastest boat in group

**Slowest** = elapsed time of slowest boat in group to complete FastestLaps

**AboutToFinishTime** = time from start to 'About-to-Finish' signal

11 Recording Forms and their use:

Two forms are useful - Form 1 is used to record each boat's crossings of the finish line and her finish time and Form 2 is used for collating and calculating the results

Form 1 is A4 portrait and has three sets of five columns and 40 rows.

Each set of columns allows record of

- 1 Boat Class - usually a 1 or 2 letter code
- 2 Sail Number - allow for six digits hand written, though often the last three digits may be sufficient (check the entry list)
- 4, 5, 6 Time: hour, minute, second - record the hour and minute only the first time they are needed, speeds and eases recording.

The form is used by entering boats in the order as they cross the start/finish line, working down the columns. No attempt is made to note the number of laps completed.

Form 2 is A4 landscape and has 23 columns and 38 rows

## FAIR HANDICAP RACING - IT IS POSSIBLE! STUART'S GUIDE TO AVERAGE LAP RACING

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### PREFACE

These notes combine articles first published in "Yachts & Yachting" and "Yachting Life", with sailing instructions developed for RYA Scotland Championship events. Opportunity has been taken to create one document which can be used by club committees in planning their events and in selling the concept of Average Lap Racing, by competitors and spectators in understanding what it means to them and by Race Officers in making sure that they give good racing.

The notes are written in September 1998 and take account of the 1997-2000 RRS. They are also written by a Briton and the idiom is UK English with a bias to Scottish. Other readers - particularly those on the West of the Atlantic - are asked to forgive any solecisms inadvertently committed.

The notes are based on the RYA Portsmouth Yardstick Scheme, a handicap scheme which has withstood the test of time - being nearly fifty years old. However any time-on-time handicap scheme can be used at the organisers choice. Minor modifications may be needed.

Most of the development of Average Lap Racing has been made by the author and Michael Harrison,

who is a National Judge, National Race Officer and Race Management Training Co-ordinator for

Scotland and a member of RYA Race Management and Championship Committee. The author, Stuart

Cresswell, is a member of RYA Portsmouth Yardstick Advisory Panel and an RYA Open Meeting Race

Officer. He is also a measurer. Both are members of RYA Scotland Dinghy Committee

### INTRODUCTION

Have you, as a Mirror sailor in an afternoon handicap race, seen the fast boats finish ahead of you and the wind disappear while you still have the up current mark to round?

Have you, as a 505 sailor, made the most of a two hour drifting match only to see a force 3 wind come in just as you finish?

Have you as a 505 sailor sat around on the beach waiting for the slow boats to finish, when you had come for racing?

Have you, as a Race Officer, sat in your box or committee boat watching the wind fade with larger and larger gaps between boats finishing and wondering whether the Toppers will get in before sunset?

Have you as Chairman of the event committee, greeted your sponsor who is going to present the prizes only to have him hanging around for hours waiting for the last boats to finish and the results to be declared?

All these scenes are typical of handicap races when there is a wide range of performance potential in the boats competing. 505 to Mirror is about 2 to 3, so for a 2 hour 505 race the Mirrors need an extra hour on average. It is the changes of wind and current during that extra hour which give rise to much criticism of 'all-in' events - whether conventional handicap or pursuit races.

The form is used by entering boats in the order as they cross the start/finish line, working down the columns. No attempt is made to note the number of laps completed.

5 If the entry is to be split into two or more fleet starts then

change: 7 Class Flags

to: 7 Class Spiffs and Flags

I should have said: handicap racing can be fairer, particularly when boats from a wide range of performance ability are racing together.

Average Lap Racing is not new. It has been used successfully for several years, at clubs in Scotland, Wales and England, and maybe elsewhere.

Basically the objective is that all the boats sail for the same period of time, and so experience generally the same wind and current conditions. Then, based on the distance they sail during that period, their times are adjusted to represent the times they would have taken to sail the same distance as the fastest boat. These adjusted times are then corrected using the appropriate Portsmouth Numbers.

RYA Scotland has, for several years, used Average Lap Racing to enhance the competition in the handicap championship events it runs. These include the Scottish Champion of Champions and Scottish Single-Handed Championships which attract top class competitors (including World Champions). (In the Scottish Champion of Champions event two sets of Portsmouth Numbers are used - one set for light, and another for heavy, conditions, the usual dividing line for dinghies being 8 knots average wind speed - but that is another matter!)

Classes competing include Tornados and other catamarans, International 14s, Mirrors and Optimists. In conventional fixed length handicap races an Optimist requires over twice the time to sail the pre-set course than does a Tornado! Put another way: for every hour that an Optimist is racing a Tornado needs only 25 minutes and hangs around for the other 35!

For the event organiser, with Average Lap Racing more races to be planned for a given period. So a two-day event can have 5 or 6 Average Lap Races of 55 to 75 minutes duration. Each race can use the same or a different shaped course. If there are a large number of entrants, competitors can be divided into two or three fleets starting at, say, three minute intervals, but still sailing in the same race.

#### WHAT CHANGES FROM NORMAL HANDICAP RACING CAN WE EXPECT?

In practice few, and most are for the Race Officer. The following explanations are designed for different people - some sailors, some organisers, etc. Choose the viewpoint to suit your involvement and needs. However reading it all will give you the full picture

#### Viewpoint 1

**Competitor:** Average Lap racing is the fairest form of handicap racing.

- 1 Prepare for the event as any other, being particularly careful when reading the Sailing Instructions.
- 2 Start at your start signal, and choose your best route round the course, sail as fast as you can.
- 3 Keep on sailing the course until finished - there is no predetermined fixed number of laps - every lap will be the same starting and finishing at the start/finish line, which you must go through at the end of every lap. Do not forget that or you will lose credit for the lap!
- 4 Shortly before the time he intends treating boats as finishing, the Race Officer makes the About-to-Finish signal.
- 5 Stop racing when you have crossed the line after the About-to-Finish signal.

#### A SOLUTION - AVERAGE LAP RACING

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6 under: 9 The Course

include: Number of Rounds

There will be one race, but the start will be split into (b) fleets. Fleet signals and order of starts are described below.  
Note: set number of fleets (b) and their splits to suit entry, describe the boats to start in each fleet with

Warning flags

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Warning flags

7 under: 9 The Course

include: Number of Rounds

The number of rounds is not predetermined.  
The course description must: (i) include the start/finish line at the end of each round and (ii) have each round identical.

8 under: 11 The Start

include: description of the starting procedure chosen taking account of multiple starts, if applicable

8 under: 14 The Finish

include: Finishing Procedure

Shortly before the finish the flag "S" will be displayed with two sound signals. This is the About-to-Finish signal. All boats will finish the race when they next pass through the finish line at the end of their current round.

9 under: 16 Time Limit

include: RRS35 shall not apply. The time limit for each boat shall be determined by the formula :

TimeLimit = PlannedRaceTime \* (1 + Factor / LapsCompleted)

where:  
PlannedRaceTime = the time which the race was intended to take  
LapsCompleted = the number of rounds completed by the boat prior to the finishing signal.  
There is an absolute upper time limit of (c) minutes

Note: Insert PlannedRaceTime, Factor and (c) which will be determined by the event planning.  
Suggested values are:  
Factor = 1.25  
c = PlannedRaceTime \* 1.50

Alternatively, and it may be simpler to use and understand, a table can be included in the S/S showing the time limit for each possible number of rounds and planned race time. Times in the table can be rounded to whole minutes.

not be, and usually is not, the first finisher. These adjusted times are used with the Portsmouth Numbers to give Corrected Times.

14

Some computer packages make Average Lap Race processing simple. If so just follow the instructions and skip the manual steps.

15

Otherwise it is done in two steps manually.

- For each boat count the number of passages through the line including the finish and then
- use the formula in Viewpoint 4 under SI 18 Scoring

16

Before publishing the results (computer or manual) make the usual checks for errors but in addition:

- Have all boats with the same handicap number sailed the same number of laps
- If not, has any boat, which sailed fewer, been given a corrected time faster than boats sailing more
- If so apply the adjustment given in the second part of SI 18 in Viewpoint 4
- In case your recording was not perfect, check that the leading boats in each handicap group are those you would expect, and that the boats that you expect to lead are leading. If not, either there was a problem on the water (capsize etc) or you have a recording problem - resolve it before you go public

17 Enjoy the barbecue while someone else deals with the protests - if you have done your job properly you will not be involved.

#### Viewpoint 4

**Writing: Notice of Race and Sailing Instructions and other Documentation: what to include or modify**

- The Notice of Race and Sailing Instructions need small modifications to cover Starting (for multiple fleet starts), the course, finishing and scoring. Two special forms are useful - only one if a computer is used for the calculations.

**2 The Notice of Race must include two extra items:**

- that the racing will be on an Average Lap Racing basis and  
(b) the handicap system to be used eg RYA Portsmouth Yardstick Scheme

**3 Most Sailing Instructions clauses are not affected, but take note of the following**  
*(Paragraph numbers from RRS Appendix N Sailing Instructions Guide  
Scoring is based on the RYA Portsmouth Yardstick Scheme)*

**4 under:** **6 Schedule of Races**

*include:*

- All races will be Average Lap Times with an intended race length of approximately (a) minutes.  
Note: set times; (a) to suit the event, different races can have different times.

**6** There is time limit which is set in relation to laps you complete before the About-to-Finish signal. The intention is to allow those who had just crossed the line sufficient time to complete the lap they have just started.

#### Viewpoint 2

**Arithmetic: Average Lap racing is simple in principle, but the results are not obvious .**

- The principles and arithmetic are relatively straightforward, taken in stages.
- One or more boats will sail more laps than the others. This is MostLaps
- All boats sail their individual number of laps: ActualLaps in elapsed time: ElapsedTime
- Each ElapsedTime is adjusted (by multiplying by MostLaps and dividing by ActualLaps) to the time that (in proportion) the boat would have taken to do MostLaps
- Then the usual time correction formula is applied.
- The winner is the boat with the lowest corrected time - as usual.

7 There is a possible need for further adjustment if one boat sails more laps than another boat with the same handicap, but as a result of wind changes on the last lap received a corrected time higher than that of the later boat.  
  
This happens because the About to Finish signal was made after one had crossed the line and started a new lap, but before the other (slower) boat reached the line.  
  
An adjustment is made to the slower boat's corrected time to compensate for the fact that the faster boat slowed on her last lap.

The slower boat's corrected time is increased on the assumption that had she sailed the same number of laps as the faster boat, she would have slowed on her notional extra lap in the same proportion as the faster boat. Strictly the adjustment needs the faster boat's time as she starts her last lap, but in a large fleet it is unlikely that this was noted, so we use the About-To-Finish signal time.

The actual adjustment is given in Viewpoint 4 Under SI 18 Scoring, but it can also be written:

$$\text{ModifiedCorrTime} = (\text{corrected time of slowest boat sailing})$$

$$(\text{FastestNoOfLaps}) * (\text{ElapsedTime}/\text{AboutToFinishTime})$$

and because ElapsedTime for any boat is always greater than AboutToFinishTime, the adjustment always gives a slower modified corrected time to the boat completing more laps.

Using the time of the About to Finish signal is slightly generous to the slower boats, but still keeps them in the right order compared with the boats sailing more laps.

Note: this adjustment is only necessary when boats with the same handicap sail a different number of laps and one or more of those sailing fewer laps has a better CorrTime than a boat sailing more laps. It is only made to the slower boats

### Viewpoint 3

**Event Manager and Race Officer: Average Lap racing gives good event time management and you want to run the event to time. You want to enjoy giving good fair satisfying racing**

- 1 The races take a predictable time - about 20% more than the time indicated in the Sailing Instructions.

You can get in the planned number of races.

The small courses needed means that clubs with limited water area can put on a race for a wide range of classes.

You can tell the sponsor the right time to arrive for the prize-giving

You can light the barbecue at the right time

You can send competitors and event team home on time

- 2 Make sure that your Sailing Instructions are right and get a National or Open Meeting Race Officer experienced in Average Lap Racing to proof-read.

Set any course which gives a good mix of sailing, such as triangle, trapezum or windward-leeward, but every round (or lap) must be the same. This is essential otherwise it is impossible to apply the adjustments fairly.

Make the course small enough so that, under the expected conditions, the slowest boats will do 3 laps in the allotted time. In practice it is easy to set too large a course - it is better to err on the small size and have more laps.

Anchor the Committee boat between a minimum of 150 metres upwind of the leeward mark to a maximum of one third of the way up the beat, and set a fair start line. Stay there for the rest of the race.

Set a short Start line. The line remains the same throughout the race, unlike a conventional race when a new, usually shorter, line is set for finishing.

As course is relatively small, the windward leg is short and therefore the line must be kept short so that no one can lay the windward mark from one end of the line or (more likely) no one can lay the line from the leeward mark

A long line also makes it difficult for the lap recorders to identify reliably the boats crossing at the pin end.

It is possible also that there may be insufficient room for a normal start line.

It is also good practice to have separate starts for boats with "incompatible" starting characteristics - ie separate Contenders and Optimists, and Laser 400s and Mirrors.

If the event has a good entry then the normal length of line may be too long, and the entry can be split into two or more fleets starting on the shorter line at, say, three minute intervals. It is usual to start the faster boats first.

When calculating the actual times for the results, a second fleet finisher will have an ElapsedTime three minutes (assuming three minute interval between starts) less than a "same clock-time" first fleet finisher

The difference between first and last boat to finish in a single fleet race is usually much greater than the normal three minute delay between fleets starting, so it does not affect the conditions that boats experience and the fairness of the race is not compromised

- 3 Make sure that the Sailing Instructions make boats go through the start-finish line at the end of each lap and at no other time.

- 4 Start the race normally

Individual recalls present no problem, nor General Recalls for single fleet races.

With multi-fleet starts, if you have a General Recall for the first fleet, then every start moves back. If you have a General Recall on a later fleet start, then unless you can make the new start quickly, you may have to abandon the fleets already under way and start again. That means your team must rehearse the General Recall and Restart procedure carefully. You should aim to lower the General Recall signal exactly one minute after the recalled start.

You can tell the sponsor the right time to arrive for the prize-giving

As in any race, accurate lap recording is vital; not just to ensure that everyone sailed the 'full' course, but to know how many laps they had completed.

Record every boat crossing of the line.

It is also better to record the crossings in order as they happen, rather than tick off against each boat when it crosses - with a big entry, finding the boat even in an ordered list takes too long. It is useful to take boat times at the end of each lap, partly for the record, but more importantly so that there will be no error at the finish, however in big fleets full lap time recording may not be practical.

The special but simple Form 1 (described in Viewpoint 4) allows each boat's crossing of line and its associated time to be recorded. No attempt is made to keep track of who-had-sailed-now-many-laps, all that is done after the finish by transfers onto the calculation form (Form 2) or using a computer. However you may want to keep tabs on how quickly the slow boats are doing each lap to help plan the About-to-Finish signal timing.

It is better to have more than one recorder particularly with big fleets. In busy periods one records sail numbers and the other record times. They must check regularly that they have recorded the same number of crossings. A tape recorder is particularly useful in the busy periods.

If a boat does not pass through the line at the lap end then they have not sailed the course for that lap, and effectively are credited with one fewer lap than they think they sailed.

Before the planned race time is up, decide when to make the About to Finish signal. If possible make it before the first of the slow boats completes a lap (preferably its third) and in a gap in the flow of line crossings so that no one who has just passed through the line can be confused. Make a note of the time of this signal

- 5 11

After the About to Finish signal, finish all boats (regardless of lap) recording both sail numbers and times

With both computer programs and manual methods each finisher's time is adjusted in inverse proportion to the number of laps she has sailed, so that the adjusted time represents the time she should have taken to sail the same number of laps as the fastest boat. The fastest boat need