2019 Handicapping Synopsis
Monday-Night Racing at SPSC

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Time-on-Time Handicapping

We will carry on with the time-on-time handicapping and performance data that we have used at SPSC since 2012 (skipping 2010 and 2011 where we did things a little differently). Your handicap will be a rolling average of the performance of your individual boat in seconds per nautical mile — in the next race this handicap will divide your elapsed time to determine your corrected time.

Initially Assigned Handicaps

Initial handicaps are derived from an ECPHRF JOG rating via a formula

$$\text{Initial handicap} = \begin{cases} 900\,^{\text{s}}/_{\text{mi.}} + {}^{10}/_6 \times (\text{ECPHRF} - 150\,^{\text{s}}/_{\text{mi.}}) & \text{when ECPHRF} \leqslant 150\,^{\text{s}}/_{\text{mi.}} \\ 1000\,^{\text{s}}/_{\text{mi.}} + {}^{10}/_5 \times (\text{ECPHRF} - 200\,^{\text{s}}/_{\text{mi.}}) & \text{when } 150\,^{\text{s}}/_{\text{mi.}} \leqslant \text{ECPHRF} \leqslant 250\,^{\text{s}}/_{\text{mi.}} \\ 1100\,^{\text{s}}/_{\text{mi.}} + {}^{10}/_6 \times (\text{ECPHRF} - 250\,^{\text{s}}/_{\text{mi.}}) & \text{when } 250\,^{\text{s}}/_{\text{mi.}} \leqslant \text{ECPHRF} \end{cases}$$

Computing the Rolling Handicap

For each race we will compute a time-on-time handicap (and call it the imputed handicap) that would give every boat the same corrected time (with a per race normalization factor to minimize drift from the initial ECPHRF derived numbers). Each boat will have its rolling handicap determined by collecting the previous seven imputed handicaps (but see next) discarding the extreme values and averaging the middle five by geometric mean. Older imputed handicaps are discarded. All this is shown on the Monday-night scratch sheet available from the main results page of the web site www.southportsailingclub.com/results.html.

Accelerating the Convergence to a Rolling Performance Handicap

Starting in 2018 we are using a new method to assign rolling handicaps for boats that have not yet finished seven races. This will not affect boats that already have an established rolling handicap; rather, it is a way to rapidly phase out the initially assigned handicap with a genuine (if volatile) performance handicap.

After Joining Fleet	How the Rolling Handicap is Determined
initially	assigned initial handicap based on ECPHRF JOG rating
after first finish	assigned initial handicap again
after second finish	median of previous two imputed handicaps together with assigned handicap
after third finish	median of previous three imputed handicaps
after fourth finish	geometric mean of middle two of previous imputed handicaps
after fifth finish	geometric mean of middle three of previous imputed handicaps
after sixth finish	geometric mean of middle four of previous imputed handicaps
after seventh finish	standard rolling handicap
after eighth finish	standard rolling handicap discarding the oldest imputed handicap

After three races your rolling handicap is no longer dependent on your assigned handicap.

Reported Corrected Times

Corrected times will be calculated from elapsed time t by the formula $t \times \frac{^\star k}{k}$ and reported rounded to the closest second. Here $^\star k$ is the handicap of a scratch boat used as a common reference for all boats. Note that the elapsed and corrected time are the same for the scratch boat. The choice of $^\star k$ is arbitrary as it has no effect on how a boat will place — using the fastest boat is traditional — the SPSC racing page first loads with the winning boat as scratch but any competitor can be designated the scratch boat by clicking on the table row. The results page will report differences in corrected time for each boat from the scratch boat.

Boats are actually placed by ordering the $\frac{t}{k}$ fractions so actual ties on corrected time are far rarer than the (still rare but occasional) apparent ties in the reported but rounded corrected time.

The Failures of PHRF Numbers and Initial Handicaps

Using results data from Monday-night racing we have determined two alternative linear regressions from ECPHRF handicaps to estimated average performance of ECPHRF Rating + 800 s/mi. on one hand or $2 \times ($ECPHRF Rating $+ 300$ s/mi.$)$ on the other. They agree on mapping an ECPHRF rating of 200 s/mi. to an average pace of 1000 s/mi. (a measly 3.6 knots). These can be used for either time-on-distance or time-on-time handicapping for round-the-buoys racing on Lake St. Clair. They differ from the ECPHRF Rating+500 s/mi. formula that we first used in 2012 that turned out to be not only absurdly optimistic as to average speeds but also woefully inadequate to account for the performance difference between boats. Most of this shortfall was undoubtedly owing to the difference in race readiness between the lower rated boats favoured by racers and the higher rated boats favoured by cruisers — but it wasn't possible to isolate the underlying performance potential of a boat using the available data and it is against the spirit of Monday nights to do so — we want members to be able to race their boats as is. It was hoped that over time a reasonable initial handicapping formula would become apparent. This hasn't been very successful but aggregate performance has become pretty clear.

Changing the Gauge in 2018

We have used a $\times 10/7$ gauge transformation of the initial and imputed handicaps carried over from years before 2018 (up to seven such imputed handicaps for each boat — see the scratch sheet). References to results and scratch sheets in the years 2012 through 2017 will need to take this into account. The new gauge, which maps an ECPHRF rating of 200 s/mi. to an average pace of 1000 s/mi., has been selected for the convenience of competitors so that they might estimate the time to complete a course in average conditions. Note that the effective handicapping is exactly the same as before 2018.

Notes on the Formula for Initial Handicaps

Maintaining the formula we have used since 2014 to introduce new boats together with the $\times 10/7$ transformation has given us the formula for initial handicaps as stated above. Note that the formula slightly flattens out the difference in handicaps for extremely rated boats — this compensates for an inherent weakness in ECPHRF ratings rather than representing an intentional non-linearity in the rolling handicapping applied on Monday nights. Indeed, the rolling handicaps behave very satisfactorily across a broad spectrum of boats.

Also note that a new competitor need not have a valid ECPHRF handicapping certificate for their boat. As the Chief Handicapper by Default, I can estimate what your ECPHRF JOG rating would be using the ECPHRF list of rated boats and the North American list of PHRF ratings; however, new competitors are encouraged to do this analysis on their own, or fork up the $20 for an official ECPHRF rating certificate. The online registration system will accept your entered JOG rating and feed the calculated initial handicap into the online scoring system automatically.