



# **The CYBC Handicap System for Cruisers**

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Version 1.4  
Date: 14.07.2009



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### 1. Mission Statement

The CYBC handicap system is a performance based personal handicap system which recognises the wide range of boats and the widely differing abilities of different crews.

The aims of the CYBC handicap system are:

- **Assigning Handicaps**  
By assigning handicaps on the basis of boat and crew performance to ensure that as many competitors as possible in each race, sailing at or near their best, would have an equal chance of winning.
- **Maximise Participation**  
To maximise participation in cruiser racing by all levels of sailor in as wide a variety of boats as possible.
- **Promote Excellence**  
To promote excellence in racing by encouraging sailors to strive to improve their performance from race to race.

### 2. Handicap Basis

The CYBC handicap authority will establish a suitable basis rating for each boat.

It is therefore essential that each race participant provides the CYBC handicap authority with detailed information regarding the boat e.g.:

- Boat Type
- Manufacturer
- Year of Build
- Keel Type
- Modifications (folding prop, larger genoe etc.)

Based on the provided information the CYBC handicap authority will establish the standard (basis) handicap for the boat type. If a participant has already obtained an official standard rating (IRC / ECHO) he/she can provide this information and it will be taken into account. However: for local club racing it is not necessary to obtain an official rating!

### 3. Aim

The aim of the CYBC handicap system is that, in theory (after some races), a balanced handicap system should provide equal chances for each boat/crew to win the race. This applies for all boats raced in the CYBC club environment.

Each race should end up in a draw result with equal race times.

Therefore the chance to win is the same for each boat in each race.

It must be the aim of the handicap modifications that this will be achieved after some races.

In other words: a boat should not have a higher handicap than a boat that, more often than

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not, finishes in front of it, or vice versa, a lower handicap than a boat that, more often than not, finishes behind it

### 4. Definitions

**ET:** Elapsed time of a boat in seconds

**ET<sub>avg</sub>:** average elapsed time for no. of participating boats

**TCF:** Time correction factor

**TCF<sub>st</sub>:** Standard Time Correction Factor

**TCF<sub>cur</sub>:** Current time correction factor

**TCF<sub>tmp</sub>:** Temporary time correction factor

**TCF<sub>cor</sub>:** Corrected time correction factor

**TCF<sub>ldis</sub>:** Long distance time correction factor

**WF:** Weighting factor of a race

**BAICG:** Bad As It Can Get handicap

### 5. Calculation of the Results

The race results are calculated in the following way:

1. The race time of each boat is converted into seconds
2. The race time of each boat is multiplied with the current time correction factor **TCF<sub>cur</sub>** (also know as: the handicap).

This gives the elapsed time of each boat: **ET**.

The winner is the boat with the lowest **ET**.

### 6. Calculation of the TCF<sub>cur</sub> (handicaps)

To assure fair and objective results the **TCF<sub>cur</sub>** (current handicaps) must be adjusted from time to time.

The following paragraph describes the way this will be done with the CYBC handicap system.

With an proper balanced handicap system, the elapsed times of each participating boat should be the same. This should end up in a draw race.

So far the theory.

In reality, every race is different and the results therefore tend to give a wide range of ETs.

As a result of this, the TCFs of each boat must be adjusted after **4** races.

To determine the adjustment rate, the following calculation is done:

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### **Every Race:**

After every race the *elapsed times* of all boats are *averaged* to give an average ET ( $ET_{avg}$ ) for all boats.

This is the time each boat *should* needed to finish the race.

This is done by summarizing all elapsed times and dividing them by the no. of raced boats.

The next step is to calculate the corrected time correction factor  $TCF_{cor}$  by dividing the  $ET_{avg}$  by the actual ET of each boat and then multiply the result by the  $TCF_{cur}$ .

### **Formula:**

$$ET_{avg} / ET * TCF_{cur} = TCF_{cor}$$

The result gives a corrected TCF, when multiplied by the original race time (not the ET multiplied with the actual TCF!) of each boat, this should result in the same race time for each boat.

These  $TCF_{cor}$  will be 'collected' for each boat.

### **Weighting factor**

Each race should get a weighting factor between 0 and 2, to reflect the importance/difficulty of each race.

As a guideline: a race with a higher number of contestants is more important than a race with a lower boat number.

Definition: *Number of registered boats as base number.*

$WF = 1$  if 50% of the boats race

$WF=2$  if 100% of the boats race

$WF=0.25$  if 2 boats race.

### **Every 4 races:**

The  $TCF_{cur}$  will be adjusted every 4 'physical' races. Physical races means, that for example on a Saturday when the race counts for two series (e.g. Early Bird and Saturday Series) only one result will be taken into account.

This adjustment is necessary to reflect the actual performance of the boat according to the last race environments.

The adjustment will take place in the following way:

The corrected TCFs ( $TCF_{cor}$ ) of the last 4 races will be multiplied by the weighting factor  $WF$  and the sum divided by the summed up weighting factors.

### **Formula:**

$$((TCF_{cor}R1*WFR1)+(TCF_{cor}R2*WFR2)+(TCF_{cor}Rn*WFRn) ) / (WFR1+WFR2 + WFRn)$$

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The result is the weighted averaged TCF, which forms that basis for the boat's next 4 races.

After some adjustments the current TCF for the fleet should provide a good measurement of fair racing.

### **The racing committee might decide that particular bad results of boats are not taken into account!**

This is because there might be the chance that a crew tries to improve their own handicap.

For example: If a boat generally finishes in the first ranks and then shortly before a handicap modification takes place, ends up with a very bad result, this result might not be taken into account. The race committee will decide in these occasions what to do.

BAICG is another method of preventing this from happen.

## **7. Bad\_As\_It\_Can\_Get (BAICG) Handicap**

In order to ensure the maximum amount of fairness the BAICG handicap is introduced.

This means: If a boat has a particular bad race result, the possible maximum adjustment for its  $TCF_{corr}$  will be 5% lower than the  $TCF_{cur}$

This ensures that a boat can not try to influence its handicap by getting a very bad race result.

### **Example:**

Boat 'S' has a  $TCF_{cur}$  of 0.839 and finishes a race with a  $TCF_{corr}$  of 0.722 (~15% lower)

If the 0.722 would be taken into account, the handicap of other boats rise up, because the  $TCF_{corr}$  for other boats is calculated by the  $ET_{avg}$ .

The BAICG-TCF allows a max. Difference of 5% (here: 0.799) and the new  $TCF_{corr}$  for 'S' will be calculated with 0.799. Also the 0.799 is the handicap which will be taken into account for the calculation of revised handicaps. The calculated ET for 'S' with BAICG will be the base ET for other boats handicap calculation.

**This does not apply for New Boats or Sleepers in the first four races except long distance races!**

## **8. Long Distance Handicaps**

In order to achieve a high level of fairness, it was agreed in the class meeting of 8<sup>th</sup> July 2009 that the handicap on long distance races (Wicklow, Skerries, Dalkey, Kish, Lambay) will be determined by the boats performance from the last finished long distance race before that race.

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Example: The boat "Diamond" has a standard rating of 0.813, in the 2009 Lambay race As corrected handicap (TCFcor) regarding her performance in the race was 0.861.

This handicap will be the basis for the next race.

The handicap will be changed after each completed race of a boat and is basis for the next long distance race, so the whole process is iterative.

The 'bad\_as\_it\_gets' (BAICG) handicap procedure will be applied. This means a boat can't reduce her current rating for the next race by more than 5% of her existing handicap (even new boats!).

In order to obtain current ratings for existing boats it was agreed that a result from maximum three years back will be taken into account in order to get a long distance rating for each racing boat. In cases where no record can be found (new boat/owner or never raced a long distance race in the last three years) the maximum penalty of all boats will be applied for the next race.

Example: If "Diamonds" next long distance rating is 0.861 then this rating is 6% over the standard rating. If this is the highest penalty in the fleet, this 6% penalty will be applied on top of the standard rating for an unknown boat. So if a boat has an standard rating of 0.800 the starting handicap for her first long distance race will be 0.848.

## 9. New Boats

New boats in the club will be treated the following way:

If only the boat is new and the skipper known to the club, than the handicap of the new boat is determined by:

The current standard rating of the new boat plus 10% or (if higher than 10%!) the factor the owner's old boat was in relation to the CYBC standard handicap.

For example: If a skipper owned a boat with an standard rating of 0.8 and the actual club rating was 0.92 than his rating was 15% over the standard rating.

This will result in rating the new boat with 15% over the standard CYBC handicap.

If both skipper and boat are new to the club there will be 10% 'penalty' added onto the boat's standard rating.

This action will envisage to stop so called 'trophy hunters' winning the first races too easy.

## 10. Sleepers

The definition of 'Sleepers' is that a boat has not finished for at least **five races** during the last season.

In that case the boat will be treated as a new boat and the 10% penalty is added.



### 11. Registration

Boats / Skippers who want to race must register their boat on the provided CYBC registration form. This is necessary because the CYBC boat declaration form does not include all the necessary details to establish a suitable handicap for a boat.

If a boat has an official ECHO/IRC rating from the ISA, a copy of that certificate should be provided.

The registration form can be handed-in before the racing season starts or before the first race for any particular boat.

A registered boat will be taken into account, if the boat has started its first race. Otherwise the boat is listed as registered for racing but is not used for the calculation of the result points.

This action will adjust the result points on the level of participating boats and keeping the penalty for a missed race reasonable.

### 12. CYBC and relation to ISA ECHO handicap

The CYBC standard handicap for a boat will be derived from various available information.

To determine a CYBC standard, the boat type will be checked for ratings given by several handicap authorities (ECHO, PY yardstick, IRC etc.) and compared to already registered boats in the club.

For participation in club events it is not necessary to register the boat with any of the handicapping authorities!

**However: The author likes to point out, that if it is important for a single boat to participate in non-club events, the boat might want to register itself with the ISA to obtain an official ECHO or IRC handicap.**

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## Appendix A

### Race results

#### Race 1

WF (0 – 2)

Boat	Start	Finish	Time	TCFcur	Seconds	ET	TCFcor	ET*TCFcor	Position
A	13:10:00	15:15:10	02:05:10	0.8	7510	6008	0.8574154461	6439.19	1
B	13:10:00	15:30:21	02:20:21	0.75	8421	6315.75	0.7646585916	6439.19	2
C	13:10:00	15:40:10	02:30:10	0.72	9010	6487.2	0.7146714761	6439.19	3
D	13:10:00	15:50:50	02:40:50	0.7	9650	6755	0.6672735751	6439.19	4
E	13:10:00	16:00:00	02:50:00	0.65	10200	6630	0.6312931373	6439.19	5

Sum TCFcur  
0.72400

ET avg  
6439.19

Sum TFCcor  
0.72706

Delta TFC

-0.0030624452

#### Race 2

Boat	Start	Finish	Time	TCFcur	ET Seconds	ET*TCF	TCFcor	ET*TCFcor
A	13:10:00	16:20:44	03:10:44	0.8	11444	9155.2	0.7745616917	8864.08
B	13:10:00	16:21:10	03:11:10	0.75	11470	8602.5	0.7728059285	8864.08
C	13:10:00	16:23:21	03:13:21	0.72	11601	8352.72	0.7640793035	8864.08
D	13:10:00	16:50:00	03:40:00	0.7	13200	9240	0.6715215152	8864.08
E	13:10:00	17:00:00	03:50:00	0.65	13800	8970	0.6423249275	8864.08

Sum TCFcur D ET  
0.72400

Delta ET\*TCF  
12303 8864.08

Sum TFCcor  
0.72506

Delta TFC

-0.0010586733

## CYBC Handicap System

### Appendix B

#### Weighting of races

Boat	TCF <sub>cur</sub>	WF 1 Race 1	WF 2 Race 2	WF 1.50 Race 3	WF 0.5 Race 4	Avg TCF	Weighted Avg TCF	
A		0.8	0.8574154461	0.7745616917	0.8377076190	0.8064796547	0.8190411029	0.8132680171
B		0.75	0.7646585916	0.7728059285	0.6065635721	0.6599949546	0.7010057617	0.7100226568
C		0.72	0.7146714761	0.7640793035	0.6065635721	0.6599949546	0.6863273266	0.6965345837
D		0.7	0.6672735751	0.6715215152	0.6515503704	0.7251164080	0.6788654672	0.6700400730
E		0.65	0.6312931373	0.6423249275	0.7079219316	0.0000000000	0.6605133321	0.6617390866

This results in the new **TCF<sub>cur</sub>** for the boats:

A = 0.81

B = 0.71

C = 0.70

D = 0.67

E = 0.66