



## **SOUTH WEST YACHT TIME CORRECTION SYSTEM (YTC)**

### **POLICY AND PROCEDURES for the 2019 racing season**

#### **Introduction**

1. The South West Yacht Time Correction system (abbreviated to YTC) has been developed over recent years to assist the wide variety of yacht-types that take part in local and club-based events to race competitively and fairly. It is based on the statistical models developed by Professor Linda Wolstenholme, of the Cass Business School and Emsworth Slipper SC.
2. The aim of this document is to set out the process by which a boat's YTC number is developed. The ethos throughout is to develop the number in a fair, open and transparent manner, if necessary bringing the yacht's skipper into the discussion where appropriate. It is intended that the YTC process will assist the achievement of fair racing as required by the Racing Rules of Sailing.
3. Boats competing in racing will be allocated a YTC number using the process shown in paragraphs 6 to 10 below.
4. A boat's YTC number may be used by individual clubs at their discretion: for club racing only, the YTC system allows a club's handicapping team to adjust a boat's YTC number as it sees fit.

#### **Documentation and application process**

5. Boats wishing to apply for a YTC number are to complete and submit a web-based YTC Form. This is obtained by following the process set out at [www.swytc.org.uk](http://www.swytc.org.uk).
6. The first step is to request a code to access the application form (see the example screenshots at Appendix A). The user is informed of the code by email and this should take a few moments only. The code is then entered (see the example screenshots at Appendix B) and the application form is completed (see the screenshots at Appendix C). If the system already has data about the boat on the YTC system, a recall code will be emailed to the user that when applied will automatically upload those data and populate the form with minimal input from the user, but the user will be able to edit those data if necessary and be asked to confirm that the data is correct.
7. A new form should be submitted if there is a change to a boat's data during the season.
8. Boat-owners will receive by email a YTC certificate showing the boat's allocated YTC number and the data on which that YTC number is based (see the example at Appendix D); this is generated by the YTC software under the control of the YTC administrators. If a boat's sails are measured by a YTC sail measurer during that process, a YTC sail measurement certificate will be issued: see the example at Appendix E.

#### **Process for developing a YTC number**

9. In general, a boat's raw YTC number will be calculated automatically by the YTC software using the formulae in paragraphs 11 and 12 below, although some boats (e.g. light displacement boats, gaff-rigged boats and others) will be allocated a YTC number using the formulae and other pertinent data as necessary. This number will then be adjusted to reflect the yacht's engine and propeller configuration, rig and downwind sail area using the tables in paragraph 14 below. The number so calculated shall be the boat's YTC number for events and inter-club racing, and the basic number for club events.
10. Failure to complete the YTC Form before racing may result in a temporary YTC number being issued until the necessary boat data has been obtained and checked and the necessary calculations have been completed. Late entries may also be allocated a temporary YTC number, until the necessary calculations can be completed.
11. When issued, a temporary YTC number shall not be altered; also, any results using this number shall not be altered retrospectively.

12. Queries concerning individual YTC numbers shall be made in writing to the YTC Main Committee at admin@swytc.org.uk.
13. A boat's YTC number may be used at other events, at the discretion of the relevant organising committee.

### Formulae

14. Yachts will be issued a YTC number which will be based on the formulae in the table below:

	Fin-keeled boats	Bilge-keeled boats
<b>Formula</b>	$YTC = k_f(2091 - 407d + 86d^2 - 30.5 * L - 59.6 (SA/L^2) - 810 SA^{1/3} / D^{1/4})$	$YTC = k_f (2211 - 1389d + 431d^2 - 137 * B/L - 54.9 * L^{1/2} + 455 * SA/D^{2/3})$
<b>Notes</b>	for flat single keels $k_f = 1$ , and for long keels $k_f = 0.98$ ; for non-flat keels (bulbs, winged, etc), $k_f = 1 - 0.003 * k_g$ and $k_g$ ranges from 1 for a slight flare or bulb to 5 for a winged keel.	for twin bilge keels, $k_f = 1$ ; for triple bilge keels, $k_f = 1.01$

15. Both formulae use data declared by the entrant; d = draft, B = beam, L = LOA – 0.5\*(LOA-LWL), SA = total sail area (upwind sails only, largest sail area in use), D = displacement empty/dry.

### Rig- And Engine-Related Adjustments

16. The formulae in paragraph 11 above assume a boat has a two-blade fixed propeller and a spinnaker.
17. Raw numbers will be adjusted to reflect declared engine, prop and sail configurations, using the tables below:

#### Engine related

	Percentage allowance
2-blade fixed propeller	0% (this configuration is assumed in the formulae)
3-blade fixed propeller	+2%
Folding propeller	-1%
Outboard (able to be lifted clear of water)	-2%

#### Rig related

	Percentage allowance
Use of conventional or asymmetric spinnaker	0% (this configuration is assumed in the formulae)
No use of spinnaker or other downwind sail	+2.5%
In mast reefing	+2%
Twin mast ketch	+3%
Spinnaker Area Allowance (to account for variation in spinnaker area)	The formula 1.75 - (DSA/USA) generates the percentage required.

Note: DSA is the sum of the declared spinnaker and mainsail areas;  
USA is the sum of the declared genoa (or jib) and mainsail areas.

### Collection of race timings data

18. An important part of the YTC quality control process lies in verifying that under normal race conditions, boats perform approximately to their YTC number. This is achieved by comparing their calculated performance number in a race or series of races, with their YTC number. This performance number is calculated by the YTC software using the YR2 process, from the elapsed times recorded for each boat on a race spotting or recording sheet.
19. A specimen proforma for recording these data in a fleet race is at Appendix E. A specimen proforma for a pursuit race is at Appendix F. These forms are normally completed by the race committee team. Clubs in the YTC scheme should compile a file of these recording sheets as the season progresses; these data files will then inform the end-of-season performance review process.

Note. Quite clearly, normal club spotting or recording sheets, or Sailwave print-outs, could be adapted for this task. However, in order to achieve proper analysis of the results, all the data fields shown on the templates should be on such an adapted form and should be completed for each race and the boats sailing in that race.

The YTC Committee thanks Professor Linda Wolstenholme (Cass Business School and Emsworth Slipper SC) for her kind permission to use her handicap models.

**Application Form**

Please [read the Notes](#) at the bottom of this page:-  
This form should be completed before your 1st race.

To start your application.

Please enter your eMail address   
and click **Request Code**

You will be sent an access code by email (it should only take a few seconds).

Enter the code here   
then click **Proceed**

If available, your previous data will be reloaded.

**YTC Numbers are required:-**

- Brixham Yacht Club:** For any boat proposing to enter BYC yacht racing.
- Falmouth Week Regatta:** For any boat entering non-IRC handicap classes.
- Mylor Yacht Club:** For any boat proposing to race at MYC.
- PoFSA:** For any boat proposing to race in Class A, E or W and any boat entering a pursuit race.
- Royal Cornwall Yacht Club:** For any boat proposing to race in Class A, E or W and any boat entering a pursuit race.
- Royal Torbay Yacht Club:** For any boat entering a pursuit race.
- Royal Western Yacht Club:** For any boat proposing to race in Class A, E or W and any boat entering a pursuit race.
- St Mawes Sailing Club:** For any boat proposing to race in Class A, E or U.

YTC Regatta 2018: For any boat entering the Regatta.

**Notes for the South West Yacht Time Correction System Form**

These notes are designed to explain what the YTC Team are trying to achieve with the YTC Form and how you can help us to achieve it. All the information you provide on the form is used in the calculation of the basic YTC number and the more accurate the information you give us, the more accurate the resulting YTC number will be. In general, it is more helpful to the YTC Team to give as much information as possible. If you have any questions about the YTC number you are given, please contact the YTC team in writing, preferably by email to [admin@swytc.org.uk](mailto:admin@swytc.org.uk), with your questions.

**It would be very helpful if all the dimensions discussed below are stated in metric units, i.e. metres (m), square metres (m<sup>2</sup>) and kilograms (kg) as appropriate.**

**Basic Yacht Information - Yacht Name, Sail Number etc.**  
The important bit here is the type or design of the yacht. It is important to give us as much information as possible, especially the year of build and which mark it is: Mk I, Mk II etc. If you have an IRC number for the boat please state it and, if possible, upload a copy of the certificate as a PDF file when prompted to do so by the software.

**Dimensions of Boat.**

Dimension	Definition	Unit
LOA	Length overall of the hull ONLY, excluding bowsprit, pushpit, pulpit, & transom hung rudders.	metres
LWL	Length on the waterline. This may be given by manufacturers or may be measured.	metres
Beam	Measured at the widest part at deck level.	metres
Draft	Measured from the water line to the lowest point on the keel.	metres
Displacement	This is the weight of the boat dry, as it came out of the manufacturer's premises, with no fuel, water and no other gear.	kilograms

**Sails**  
The sail areas you declare should be as quoted by the sailmaker concerned, boat manufacturer or, ideally, they should be measured by a YTC sail measurer; the areas should be stated in square metres (m<sup>2</sup>). If you are in doubt you are encouraged to request that your sails be measured. It is better not to estimate the size of the sails, as in general a less favourable YTC number than you might prefer might be the result. Please declare the areas of the largest upwind sails you will use. Similarly, for the downwind sails, please declare the largest spinnaker or asymmetric sails you will use, the type of spinnaker and the sail area. Please upload a sailmaker's

certificate, email or a YTC Sail Measurement certificate when prompted to do by the software. Also, please do not use the sail area data as given by [www.sailboatdata.com](http://www.sailboatdata.com). It is usually misleading and often wrong.

**Configuration.**

The keel type, engine & propeller configurations are used in the YTC calculation to calculate your YTC number. It is important to let us know whether your keel has a wing, bulb or flare, and the extent of it. Sketches or photographs of the keel will be helpful and can be uploaded when prompted to do so by the software.

**Indemnity.**

A boat's YTC number is generated by the YTC team in good faith, using the data supplied, historical data and, where necessary, pertinent data from other sources. The YTC team attempts at all times to give an accurate and fair YTC number but the team cannot be held responsible or liable for any losses of any type, however incurred.

**Before you proceed:-**

It will be helpful if you will upload a digital photo/scan/PDF of your existing IRC certificate (if applicable); a photo/sketch/PDF showing any bulb, flare or wing on your boat's keel and a photo/scan/PDF of documentary evidence of sail areas. These will be requested on submission of this form if required.

[Return to the Form](#)

## APPENDIX B THE CODE TO ACCESS THE APPLICATION FORM

The screenshot shows a web browser displaying the 'Application Form' page for the South West Yacht Time Correction System. The page has a blue header with the system logo and navigation links: 'YTC Home Page', 'South West YACHT TIME CORRECTION System', and 'YTC Policies:-'. The main content area has a light blue background and features a central white box with the following text: 'Please read the Notes at the bottom of this page:- This form should be completed before your 1st race.' Below this, it states 'An eMail containing the access code has been sent to tony@annton.uk.com'. There is a text input field containing '993' and a 'Proceed' button. A note below the button says 'If available, your previous data will be reloaded.' At the bottom of the page, there is a section titled 'YTC Numbers are required:-' followed by a list of clubs and their respective requirements for entering races.

South West  
Yacht Time Correction  
System

YTC Home Page South West YACHT TIME CORRECTION System YTC Policies:-

### Application Form

Please [read the Notes](#) at the bottom of this page:-  
This form should be completed before your 1st race.

An eMail containing the access code has been sent to  
tony@annton.uk.com

Enter the code here

then click

If available, your previous data will be reloaded.

**YTC Numbers are required:-**

- Britishham Yacht Club:** For any boat proposing to enter BYC yacht racing.
- Falmouth Week Regatta:** For any boat entering non-IRC handicap classes.
- Mylor Yacht Club:** For any boat proposing to race at MYC.
- PoFSA:** For any boat proposing to race in Class A, E or W and any boat entering a pursuit race.
- Royal Cornwall Yacht Club:** For any boat proposing to race in Class A, E or W and any boat entering a pursuit race.
- Royal Torbay Yacht Club:** For any boat entering a pursuit race.
- Royal Western Yacht Club:** For any boat proposing to race in Class A, E or W and any boat entering a pursuit race.
- St Mawes Sailing Club:** For any boat proposing to race in Class A, E or U.
- YTC Regatta 2018:** For any boat entering the Regatta.

**Notes for the South West Yacht Time Correction System Form**

APPENDIX C SCREENSHOTS OF THE WEB-BASED YTC DATA ENTRY FORM

South West Yacht Time Correction System

YTC Home Page South West YACHT TIME CORRECTION System YTC Policies:-

### YTC Application Form

Please [read the Notes](#) at the bottom of this page, then fill in all the compulsory fields marked \* & submit the form:-

This form should be completed before your 1st race.

**Before you proceed:-**  
It will be helpful if you will upload a digital photo/skan/PDF of your existing IRC certificate (if applicable); a photo/sketch/PDF showing any bulb, flare or wing on your boat's keel and a photo/skan/PDF of documentary evidence of sail areas. These will be requested on submission of this form if required.

Boat Name\*:

Sail Number\*:

Owner's Name\*:

eMail: [tony@annton.uk.com](mailto:tony@annton.uk.com)

Telephone Nos. \*:

Yacht Club\*:

I declare that I have read & accept the YTC Privacy Policy. \*:  Yes  No

Print Full Name\*:

Date: 15/02/2019

The following information is required to calculate your YTC Number:-

Boat Type or Design\*:

Current IRC Rating:  (if available)

LOA (m)\*:

LWL (m)\*:

Beam (m)\*:

Draft (m)\*:

Displacement (kg)\*:

Year Built\*:

Upwind Sail Areas (m<sup>2</sup>)

Genoa/Jib\*:

Main\*:

Other\*:

Total Upwind Area:

Downwind Sail

Type \*:

Area (m<sup>2</sup>)\*:

Total Downwind Area:

Sail Area Source\*:

Ketch/Yawl\*:  Yes  No

In-mast Reefing\*:  Yes  No

Keel\*:

Engine\*:

Propeller\*:

Are the rigging, sail plan and ballast of standard design?\*:  Yes  No

Comments:

Please give details of any variation from standard design and other relevant information. Also briefly list all changes since last year.

**AN EXAMPLE YTC CERTIFICATE**

**Tony Hardman**

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From: noreply@swytc.org.uk  
 Sent: 13 February 2019 15:32  
 To: [REDACTED]  
 Subject: swYTCs Certificate



**South West  
Yacht Time Correction  
System**

**YTC Certificate 2019**

Boat Name: **WARD OF CLEE** Sail No.: **1813 T**

YTC No.: **1065** White Sail: **1065**

Boat Type: **Beneteau First 285** Configuration: **OFIBF**  
 Date Issued: **13/Feb/2019** Expiry Date: **31/Dec/2019**

These YTC numbers are calculated from the following data:-

LOA (m)	LWL (m)	Beam (m)	Draft (m)	Displacement (kg)
8.44	7.62	3	1.2	2800
Jib SA (m <sup>2</sup> )	Main SA (m <sup>2</sup> )	Other SA (m <sup>2</sup> )	Upwind Total (m <sup>2</sup> )	
21.656	17.857		39.513	
Downwind Sail	<td>Downwind SA (m <sup>2</sup> )	Ketch/Yawl	Inmast Reefing	
None	0	39.513	No	No
Keel	Engine	Propeller		
Wing	Inboard	Folding/Ferret		

Certificate No.: 2019/375      Contact: admin@swytc.org.uk

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27/02/2018 South West Yacht Time Correction System - Sail Measurement Certificate



**Sail Measurement Certificate**

Boat_Name: Wizard of Clew	Sail_Number: GBR1813T	
<b>Headsail (m)</b>	<b>Mainsail (m)</b>	
Headboard (HHB): .07	Headboard (MHB): .134	
Luff_Length (HLU): 9.32	Luff_P (MLP): 9.19	
Luff_Perp (HLP): 4.57	Foot_E (MFE): 3.34	
1/4 (HQW): 3.37	1/4 (MQW): 2.804	
1/2 (HHW): 2.21	1/2 (MHW): 2.07	
3/4 (HTW): 1.082	3/4 (MTW): 1.16	
7/8 (HUW): .56	7/8 (MUW): .65	
Mid_Width (HMW): 3.5		
Foot_Length (HFL): 4.78		
Ratio HMW/HFL: 0.732		
<b>Downwind Sail (m)</b>	<b>Sail Area (m<sup>2</sup>)</b>	
Sail_Type (SST): White Sail	Headsail: 20.951	
Luff_Length (SLU):	Mainsail: 17.857	
Leech_Length (SLE):	Downwind: 0.0	
Half_Width (SHW):	Total Upwind Area: 38.808	
Foot_Length (SFL):	Total Downwind Area: 38.808	
	Ratio Downwind/Upwind: 1	
Comments: Test measurement		
Measurer: A Davis	Date: 27/02/2018	



TEMPLATE YTC RACE DATA COLLECTION SHEET FOR A **FLEET** RACE

CLUB		RACE (Series, race number)	TIME OF START FOR CLASS	DATE
CLASS	COURSE SAILED		Wind direction / speed at start	Wind direction / speed at finish

Sail number	Boat	Owner	YTC number	Finishing time	Elapsed time	Corrected time	Position

TEMPLATE YTC RACE DATA COLLECTION SHEET FOR A PURSUIT RACE

<b>CLUB</b>		<b>RACE</b> (Series, race number)		<b>DATE</b>	
<b>CLASS</b>	<b>COURSE SAILED</b>		<b>Wind direction / speed at start</b>		<b>Wind direction / speed at finish</b>

Sail number	Boat	Owner	YTC number	Start time	Finishing time	Elapsed time	Corrected time	Position